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WITNESS my hand this
Twenty-fifth day of October 2004

LEANNE MYNOTT
MANAGER EXAMINATION SUPPORT
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Patents Act 1990

PROVISIONAL SPECIFICATION FOR THE INVENTION ENTITLED:

TOASTER GRILL WITH LOCKING HINGE

This invention is described in the following statement:-

Toaster Grill with Locking Hinge

Field of the Invention

The invention pertains to toaster grills and more particularly to a toaster grill that can safely assume a variety of cooking positions including a fully open grill position.

Background of the Invention

A sandwich press has a lower housing that supports a lower cooking surface. The upper cooking surface is carried by an upper housing that pivots about a "U" shaped frame. The frame is hinged to the rear of the lower housing. The "U" shaped frame further comprises a transverse handle that allows the user to raise and lower the upper housing. In a typical sandwich press, the upper and lower cooking surfaces are flat.

Similar configurations are used in electric grills. The operating temperature of an electric grill is higher than that of a typical sandwich press. In these types of grills, both the top the upper and lower cooking surfaces include parallel ribs which provide cooked meat with characteristic sear marks and also promote the run off of cooking juices. However, neither prior art sandwich presses nor prior art meat grills are known to have fully open grill position in which both cooking surfaces are facing upward, generally co-planar and horizontal.

Objects and Summary of the Invention

It is an object of the invention to provide a combination toaster and grill comprising upper and lower housings and upper and lower cooking surfaces. The upper and lower cooking surfaces can assume a fully open grill position. In the fully opened grill position, the upper and lower cooking surfaces face upward, are generally co-planar and horizontal.

In some embodiments of the invention, the upper cooking surface is provided with ribs and the lower cooking surface is flat. In particular embodiments of this sort, the ribs are tapered. In particularly preferred embodiments, a single variable thermostat is used to control the temperature

of the lower cooking surface and a fixed thermostat is used to establish the temperature of the upper cooking surface.

In other embodiments of the invention, the lower cooking surface is tilt adjustable.

In yet other embodiments of the invention, the position of the upper housing and upper cooking surface are controlled by a user operated locking hinge.

In particularly preferred embodiments, a track arm is used to control the movement of the tilting upper housing, particularly in the open and fully open grill positions.

In other embodiments of the invention, a full length drip tray collects run off from both the upper and lower cooking surfaces when the toaster grill is in the fully open grill position.

Accordingly, there is provided a toaster grill having a lower housing that supports a lower cooking surface and an upper housing that supports an upper cooking surface. The upper housing pivots with respect to a "U" shaped frame that is hinged with respect to the lower cooking surface. A locking hinge allows the pivoting motion of the frame to be arrested somewhere between the fully closed and fully open grill position. The locking hinge automatically resets when the upper housing is rotated from the fully open grill position to the fully closed position.

Brief Description of the Drawing Figures

Figure 1 is a front isometric view of a toaster grill in accordance with the teachings of the present invention;

Figure 2 is a rear isometric view of the device depicted in Figure 1;

Figures 3-6 are side elevations illustrating different positions of the upper housing and upper cooking surface;

Figure 7 is a side elevation of the device depicted in Figures 1 and 2 illustrating the upper housing spacing mechanism;

Figure 8 is a perspective view of the device depicted in Figure 1 in a fully open grill position;

Figure 9 is an exploded perspective of a locking hinge;

Figure 10 is an isometric view of a frame arm shroud;
Figure 11 is a rear isometric view of a control knob;
Figure 12 is an isometric view of a hinge facia;
Figures 13 and 14 are isometric views of a lock barrel;
Figures 15 (a) and (b) are isometric views of a toggle;
Figures 16 and 17 are isometric views of a track arm;
Figure 18 is a top plan view of a locking hinge illustrating section lines used in the interpretation of Figures 18-37;
Figures 19-37 are cross-sectional views of a locking hinge illustrating the selective positioning of the top cooking surface in the fully closed, open, fully open grill and reset positions;
Figures 38-40 are side elevations, partially sectioned, illustrating the automatic operation of the actuator arm and support finger;
Figure 41 is an exploded perspective illustrating the lower cooking plate tilt mechanism;
Figures 42 and 43 are cross-sections illustrating the two positions of the lower cooking plate;
Figure 44 is an exploded perspective of a variable thermostat coupling;
Figure 45 is a cross-section illustrating the relationship between control knob, coupling and thermostat;
Figures 46-48 are cross-section illustrating anti-drip features of the present invention;
Figure 49 is a perspective view of the upper cooking surface illustrating the spout 230;
Figure 50 is a plan view of the upper cooking surface;
Figure 51 is a perspective of the upper housing and its handle; and
Figures 52-56 are circuit diagrams illustrating components and methods of powering the toaster grill of the present invention.

Toaster Grill Overview

As shown in Figure 1, a combination sandwich press and grill 100 has many of the external appearance attributes of a sandwich press. It comprises a lower housing 102 with a lower cooking plate 104. In this embodiment, the

cooking plate is shown as being flat although it may also be provided with ribs. To allow for the run-off of cooking liquids, a discharge spout 105 interrupts the elevated rim 106 that serves as a perimeter or barrier to the lower cooking plate 104. The discharge spout 105 leads into a removable, full-length drip tray 106.

In preferred embodiments, the rear corners of the lower cooking surface 104 are each formed as functional components of the main hinge mechanism 107 and 108. The left hinge member 107 includes a locking mechanism 900 performs a range of functions which govern the positioning of the upper housing 109 and its upper cooking surface 110 with respect to the lower cooking surface 104.

As shown in Figures 2 and 9, the hinge components 201, 202 that comprise the rear left corner area of the lower cooking plate 104 are formed as spaced apart flanges with concentric openings. These hinge components support the hinge locking mechanism 900 as well as one end of a generally "U" shaped frame 204 that supports the upper housing 109. As shown in Figures 1-8, a pivot 205 attaches the upper assembly 109 to each side arm of the "U" shaped frame 204 at points approximately mid way along each arm 206.

As shown in Figures 3-8, the upper housing 109 may be positioned into a number of different cooking positions with respect to the lower cooking plate 104. As will be further explained, the tilt position of the lower cooking plate 104 is also adjustable. As shown in Figures 3 and 7, the device 110 has a fully closed position. An adjustment mechanism 120 (well known in sandwich presses) allows the upper and lower housings to be locked together for storage purposes. This same mechanism 120 allows the upper housing 109 and the upper cooking plate 110 to be spaced apart from and above the lower cooking plate 14 in a number of discreet steps. In these cooking and toasting configurations, the upper cooking surface 110 will tend to remain generally parallel with a lower cooking surface 104. However, it is free to pivot to accommodate irregularly shaped foods. The upper housing 109 is provided with an adjustment handle 130 (see Figure 51) that can be used to manipulate or position the tilt angle of the upper housing 109 and its cooking plate 110.

As shown in Figure 5, the upper housing 109 can be opened to a point where it rests against stops located within the hinge mechanism 107. In this position, it is opened to about 110° from horizontal. In this position, gravity tends to urge the upper housing 109 against the internal stops and gravity therefore tends to keep the device in this open position. As shown in Figure 46 and as will be further explained, in this open position, the lowest edge of the upper cooking surface 110 is automatically positioned over the lower cooking surface 104 so that it drains directly onto the lower surface 104. This positioning of the lower edge of the upper cooking surface is achieved by means of a track arm 928 as will be detailed in latter parts of this description.

As shown in Figures 6 and 8, the device 100 is also capable of assuming a fully open grill position. In this position, higher temperatures (particularly at the lower cooking surface 104) can be used to cook meats, eggs and other foods that would normally be fried or grilled. As will be further explained, this position is achieved by manually deactivating the locking mechanism 107. In this open grill position, the "U" shaped arm 204 serves as a foot. As depicted in Figures 6 and 40, the cross-piece or handle 600 makes contact with the bench or counter top so as to better support the upper housing 109. In preferred embodiments, the handle 600 is slightly bowed or curved so that it makes contact in its centre. It should be noted that in the open grill position, the upper housing 109 and its upper cooking surface 110 are effectively immobilised. Any tendency for the cooking surface 110 to tilt is eliminated by mechanical features as will be further explained. Figures 2 and 47 also illustrate that the liquid run-off of the upper plate 110 is collected by a discharge spout 230 located at the front of the upper cooking surface 110 (when fully opened). The spout 230 discharges into a rear portion of the drip tray 106 that protrudes through the back surface of the lower housing 102.

Hinge Locking Assembly Overview

An overview of the locking mechanism 900 is presented here. A more detailed discussion follows in the explanation of the operation sequence. As shown in Figure 9 an appliance such as a toaster grill 100 has a lower cooking plate 104 that includes hinge components 201, 202 formed as a backing plate 202 and a lock barrel retainer 201. The backing plate has a journal opening

965 for receiving an enlarged distal head 970 of the lock shaft 915. The lock barrel retainer 201 has openings 901 for admitting one or more set screws or roll pins 902 that are used to hold the lock barrel 903 in place (see Figures 13 and 14). The barrel 903 has cooperating pin retaining openings 905, 906.

The lock barrel 903 is covered by an ornamental lock facia 907 (see Figure 12). The facia 907 includes a recess 908 for receiving an operating knob 910 (see Figure 11). The knob 910 includes a stub shaft 911 that passes through an opening in the facia 907 and is received by a first opening 912 in a lock coupling 913. The coupling 913 extends to connect with a stub shaft 914 formed on the proximal end of the lock shaft 925.

The lock shaft carries two spring loaded pins. The first is the cam pin 980. It operates on the underside of the toggle 1340 and controls it in response to the user defined position of the control knob 910. The reset pin 960 is engaged by cooperating cam surfaces formed into the lock barrel and the track arm so as to reset the lock shaft, control knob etc., when the user closes the device after using the open grilling position.

The left arm 204 of the "U" shaped frame terminates in a cylindrical shroud 926. The shroud 926 has an internal bore in which is formed a tooth 927 that is used in limiting the range of motion of the "U" shaped frame.

As shown in Figures 9, 16 and 17, a track arm 928 is located between the base plate 202 and the shroud 926. The track arm includes a pilot rim 929 that pilots into an expanded bore 930 of the shroud 926. The track arm also includes a central opening 931 that acts as a cam surface for the spring loaded reset pin 960 and a step 950 that acts against the reset pin 960 during the reset phase of motion. In the example of Figure 9, the reset pin 960 is rectangular and resides in a radial opening 961 in the lock shaft 925. Offset from the rear face 1710 of the track arm is a retaining arm 1720 in which is formed an elongated slot 1730. As shown for example in Figure 19-29, 2100 is a pin formed, for example, on the upper housing and the pin rides in the slot 1730. Thus the position of the track arm determines aspects of the motion of the upper housing as will be explained.

The track arm 928 has a pilot rim 928 within which is formed a first bore 1610 and a smaller, deeper second bore 1620. The first track arm bore 1610 has formed in it a first limit member 1615 and the second track arm bore

has a second limit member 1630. The limit members may be integral or inserted separately into the track arm body so that harder materials may be used as depicted in Figure 17.

As shown in Figures 9 and 13-15, the lock barrel 903 comprises a main body section 1301 in which are formed the pin retaining openings 905, 906. A mid-body 1305 with a half bore 1310 leads to an end plate 1320. A pair of cooperating openings, one in the end of the main body 1325, and one in the end plate 1330 support a toggle shaft 1335 that passes through an opening 1336 in the toggle 1340. As will be explained the toggle 1340 selectively limits the motion of the "U" shaped frame and upper housing in response to the position of the control knob 910. As shown in Figure 13, the inner face of the end plate 1320 includes an arcuate bumper 1340 having first 1342 and second 1344 rotational end stops. The second limit member 1630 within the track arm acts against the end stops 1342, 1344 of the bumper 1340 to limit the absolute range of motion of the track arm 928. The bumper also has an underside or cam surface 1350 that has the same profile as the cam surface 931 of the track arm 928. When the track arm is carried into the fully closed position, the cam surfaces 931 and 1350 align as do the step 950 and the first rotational stop 1342 of the bumper 1340.

Operational Sequence of the Locking Mechanism

The operational sequence of the locking hinge assembly 107 will now be explained with reference to drawing Figures 18-37. These drawing figures represent cross-sections taken through four distinct vertical planes. Figure 18 illustrates the four planes that will be referred to. With reference to the axis of the locking mechanism 900, the drawing figures the term "inward" describes a direction from the knob 910 toward the backing plate 202 and the term "outward" describes the reverse direction.

With reference to Figure 18, the section A-A is a section through the toggle 1340 but outward of the cam pin 980. Section B-B passes through the cam pin 980. Section C-C passes through the reset pin 960 and the lock barrel bumper 1340. Section D-D passes through the reset pin and track arm 928.

A. FULLY CLOSED AND LOCKED

Figure 19 is a cross-section through the A-A plane illustrating the arm 204 and therefore the upper housing in the fully closed position. As shown in this figure, the toggle 1340 is urged by the cam pin 980 into an extended position. In this position, the tail end 1910 of the toggle 1340 contacts the locking shaft 925 and the tip or head end 1920 of the toggle does not interfere with the inside diameter 1930 of the shroud 926. Figure 20 is taken through plane B-B and clearly shows the cam pin 980 impinging on the curved underside of the toggle 1340. In this view it can be seen that the cam pin 980 is in a fully extended position. As shown in Figure 21, the reset pin is depressed by the underside 1350 or cam surface of the bumper 1340. The reset pin is also depressed by the cam surface 931 of the track arm 928.

B. OPEN AND LOCKED

Figure 22 is a cross-section through the hinge locking mechanism 107 through plane A-A. As shown here, the parallel arms 204 of the "U" shaped frame and therefore the upper housing are in an open position. The upper cooking surface 110 can not rotate away from the lower cooking surface 104 because the tooth 927 in the shroud 926 is interfered with or prevented from further rotation by the head 1920 of the toggle 1340. A user can bring the upper and lower cooking surface together, but because the upper housing is inclined by more than 90° (approximately 110°) gravity tends to keep the upper housing in this upright and open position leaning against the stop provided by the toggle 1340. Figure 23, taken through plane B-B shows that the second limit member 1630 of the track arm 1928 also impinges against the inner portion of the head of the toggle 1340 when the upper housing is in the open position. Figures 24 and 25 (taken through planes C-C and D-D respectively) show that the lock shaft 925 is still in the "locked" position and that the step 950 of the track arm is rotated away from its closed position.

C. CLOSED AND UNLOCKED

In order to position the upper housing and upper cooking plate 110 into a fully opened or grilling position, it is necessary to first close the device by using the handle 600 to bring the "U" shaped frame and the upper housing

into a fully closed position. When fully closed, the control knob 910 is rotated counter clockwise (for example with reference to Figures 2 and 9). This has the effect of rotating the lock shaft 925 and the cam pin, thus urging the toggle into an "unlocked" position as shown in Figures 26-29. Figures 26-29 are taken respectively through planes A-A, B-B, C-C and D-D. As shown in Figure 26, the locking shaft 925 has been rotated into the retracted or "unlocked" position. As shown in Figures 26 and 27, the cam pin 980 now impinges on the tail 910 of the toggle 1340. This has the effect of rotating the head 1920 about the shaft 1335 into a position where it is clear of the rotational movement of the tooth 1630. As shown in Figures 28 and 29, the reset pin 960 is now extending as the underside 1350 of the bumper 1340 nor the cam surface 931 of the track arm 928 release it. From this position, the "U" shaped frame and upper housing are free to be rotated, by the user, past the open position into a fully open or grill position.

D. GRILL POSITION

Cross-sections of the lock mechanism 107 in the grill position are depicted in Figures 30-33. Figures 30-33 are taken through planes A-A, B-B, C-C and D-D respectively. As shown in Figures 30 and 31, the tooth 927 and second limit member 1630 of the track arm 928 have rotated past the toggle 1340 without interference. In this position, the upper cooking surface 110 is in a horizontal position and the handle 600 of the "U" shaped frame is resting on the same surface that supports the lower housing. As seen in Figures 32 and 33, the reset pin 960 is fully extended. With reference to Figure 32, the track arm 928 is fully extended and prevented from further rotation away from the lower cooking surface because the first limit stop 1615 of the track arm 928 is up against the first rotational stop 1342 of the bumper 1340. Because the upper housing's pin is located within the slot 1730, the upper cooking surface 110 is prevented from further clockwise rotation about its pivot (clockwise being relative to the depiction in Figure 32). Counter clockwise restraint of the upper cooking surface will be dealt with below.

E. RESET

From the grill position depicted in Figures 30-33, the user can close and reset the hinge locking mechanism 107 simply by grasping the handle 600 and fully closing the unit. This motion of the upper housing, "U" shaped frame and track arm 928 have the effect of resetting the locking mechanism so that subsequent attempts to open the unit and counter the mid point locking position depicted in Figures 22-25. This re-setting action is depicted in Figures 34-37.

Figures 34-37 are taken through planes A-A, B-B, C-C and D-D respectively. Figures 36 and 37 illustrate that the step 950 in the central bore of the track arm has caught the extended reset pin 960 and is thus rotating the reset pin 960 and the lock shaft 925 back toward its original position. As this is occurring the cam surface 1350 of the lock barrel guides the reset pin back into its bore, retracting it, as the rotation of the lock shaft continues under influence of the track arm.

When fully reset, the reset pin is retracted and clear of the track arm. As the lock shaft 925 and the cam pin 980 rotate cock wise in these views, it can be seen in Figures 34 and 35 that the cam pin 980 is now allowed to extend and lift the toggle's head 1920 radially outward into a position where it will interfere with the tooth 927 and first limit 1630. When the unit is reopened, the "U" shaped frame and upper housing will stop in the open position.

Restraining of Upper Housing

In cooking positions between the fully closed position and the open position depicted in Figures 22-25 and Figure 5 it is important that the upper housing is free to pivot within a limited range about the horizontal pivots 205. This allows irregular objects to be contacted evenly by both the upper and lower cooking plates even if the object being cooked does not have a parallel top and bottom. One limitation in this range of pivoting motion is the requirement that the upper cooking surface 110 be rigidised or restrained from pivoting when it is in the fully opened or grill position. As previously mentioned, a portion of the limitation of motion is accomplished by the interaction between the upper housing's pin and the track arm as explained

As shown in Figure 41, the front of the toaster grill 100 comprises a control panel 4100. A knob on the control panel 4110 is used to rotate a crank 4120 that has an extension 4130 that connects to a control arm 4140. The other end of the control arm 4150 attaches to a pivot location 4160 located on the underside 4170 of the lower cooking surface 104. Thus, rotation of the tilt adjustment control knob 4100 has the effect of raising and lowering the front edge 4180 of the lower cooking surface 104. Figure 42 illustrates the lower cooking surface 104 in a tilted position where the front edge 4180 is lower than the rear edge 4200. Figure 43 shows that rotation of the control knob 4110 has caused a lifting of the front edge 4180 so that the surface (or rib tops) is approximately level.

Thermostat Linkage

In preferred embodiments of the invention, an adjustable thermostat is mounted directly to the underside of the lower cooking surface 104. So that this adjustable thermostat may be used or operated with a control knob located on the control panel 4100, a mechanical linkage or coupling is required. Figures 44 and 45 illustrate such a linkage. As shown in these figures, a control knob 4500 on the control panel 4100 is attached to a stub shaft 4400 that passes through the control panel 4100. The distal end of the control shaft 4400 comprises a coupling portion 4410 that attaches to ball 4420 having retaining stubs 4430 that are snapped into cooperating grooves 4440 located in the stub shaft's coupling portion 4410. The ball 4420 is part of a floating shaft 4450 having a similar ball arrangement 4460 at the other end. The second ball and stub arrangement 4460 is retained by a second coupling portion 4470 which has a bore 4480 for receiving the control shaft 4520 of the thermostat 4530.

Drip Control

As mentioned, the toaster grill of the present invention is adapted for toasting and grilling. Toasting, for example of sandwiches, occurs at a cooking temperature of about 180°C. Grilling of meats occurs at temperatures of about 230°C. Higher temperature cooking, particularly of meats, results in a release of fats and juices from the meat. Further, cooking at higher

temperatures may also require the use of cooking oils. Therefore, it is important to provide features for removing and collecting excess cooking liquids from the cooking surfaces. Figure 46 specifically illustrates an important relationship between the upper and lower cooking surfaces 110, 104. In this illustration, the toaster grill 100 is depicted in the open position. Note that the lower edge 4610 of the upper cooking surface 110 is located above a portion of the lower cooking surface 104. This means that any cooking liquids dripping from the lower edge 4610 fall onto and are collected by the lower cooking surface 104. Also shown in this view is a transverse gutter 4620 that extends along the lower edge of the upper cooking surface 110. This gutter leads into the discharge spout 230 (better seen in Figure 2, 49 and 50). As previously mentioned, the action of the track arm 928 prevents the undesirable rotation of the upper cooking assembly 109 in the direction of the arrow 4630. Because of the rim 4640 along the rear edge of the lower cooking surface 104, liquids discharged from the upper cooking surface are eventually discharged through the lower cooking surface's front spout 105 into the drip collection tray 106.

As shown in Figure 47, when the upper housing 109 is in the grill position a slight inclination forward of the drainage surface below the rib tops, results in a discharge of cooking liquids through the discharge spout 230 into the rear 4710 of the drip collection tray 106. In this way, drippings may be collected at the rear of the tray 4710 from the top spout 230 as well as into the front of the tray 4720 from the lower spout 105.

Figure 48 illustrates that the drip collection tray 106 can be removed from the toaster grill 100 by sliding it horizontally out of the lower housing. Note that a bumper 4810 serves to limit the travel of the tray 106 and correctly positions it so that it can collect from both spouts 230, 105. The bumper 4810 may cooperate with a cooperating shoulder 4820 formed into the lower rear corner of the tray 106.

Details of Upper Cooking Surface

As shown in Figures 49 and 50, the upper cooking surface 110 preferably comprises an aluminium casting which is coated with a non-stick material. In preferred embodiments, the upper cooking surface 110 carries a

number of parallel ribs 4910 which are generally parallel with the sides of the toaster grill 100. In particularly, preferred embodiments and as shown in Figure 49, the ribs are tapered, being slightly higher at their fronts 4920 than at their rears 4930. This allows the tips 4940 to remain generally horizontal when the surface is in the grilling position while still providing drainage toward the spout area 230 of the surface that occupies the space 4950 between and around the ribs 4910. Where the lower cooking surface 104 is provided with ribs, it is preferred that this same arrangement be maintained, that is, ribs that taper toward a maximum height adjacent to the spout area and that the rib tips or tops remain generally horizontal subject to the tilt action described in Figures 41-43.

Adjustment Handle

As shown in Figure 51, the upper cooking surface 109 has a front edge 5110 to which a handle 130 is attached. In preferred embodiments, the handle is attached from the obverse side of the front face 5110 by one or more fasteners 5120. In this example, the handle 130 includes spacers 5130 that maintain a slight air gap between the front face 5110 and the handle 130. The handle allows the tilt angle of the upper housing 109 to be adjusted, even when it is hot.

Circuit Configurations

A first circuit diagram for a combination sandwich press and grill 100 is shown in Figure 52. As shown by the circuit diagram of Figure 52, the electrical circuit includes a base plate heating element 5200 and a top plate-heating element 5202. The base plate-heating element 5200 is preferably an 1100 W/240V element and the top element 5202 is preferably á 5200 W/240V. A thermal fuse 5204 prevents the device from over heating. A user controlled, variable thermostat 5206 provides an operating range of about 180 C to 220 C. When the variable thermostat 5206 reaches an operating temperature of 200 C, a remote micro switch 5206 bypasses the 200 C fixed thermostat 5210 of the top heating element in favour of a 220 C fixed thermostat 5212.

Another embodiment of the invention utilises the circuitry depicted in Figure 53. In this embodiment, the circuitry includes a thermal fuse 5300 and a single 180/220 C variable thermostat 5304. Note that the variable thermostat 5302 controls only the base plate-heating element 5304, which is preferably an 1100 W/240V type element. The top plate-heating element 5306 is preferably a 1300 W/240V heating element that is regulated by a single 200 C fixed thermostat 5308.

As shown in Figure 54, a third embodiment of the invention incorporates an electronic circuit incorporating a user activated switch 5400 which allows for the disconnection of the top heating element 5402. The top-heating element 5402 is preferably a 1300 W/240 V element that is regulated by a single 200 C fixed thermostat 5404. The same user activated switch 5400 allows for power to be supplied to either of two base plate-heating elements 5406, 5408. The first heating element 5406 is an 1100 W/240 V element where as the second base plate element 5408 is a 1300 W/240 V element. Both base plate elements 5406, 5408 are regulated by a 180/220 C variable thermostat 5410.

A fourth embodiment is depicted in Figure 55. In this embodiment, base plate heating elements 5500, 5502 as well as the top plate-heating element 5504 are regulated by a 180/220 C variable thermostat 5506. This embodiment also allows the user to selectively activate or deactivate the top plate cooking element 5504 (with the switch 5400) while at the same time selecting between one or both base plate heating elements 5500, 5502. In this embodiment, the first base plate-heating element 5500 is preferably 1100 W/240 V and the second base plate-heating element 5502 is preferably 1300 W/240 V. The top plate element 5504 is preferably 1300 W /240 V.

A fifth and preferred circuit diagram for a combination sandwich press and grill 100 is shown in Figure 56. As shown by the circuit diagram of Figure 56, the electrical circuit includes a 15A main switch 5601, a base plate heating element 5600 and a top plate heating element 5602 in parallel with the base plate. The base plate and the top heating elements 5200, 5206 are both preferably 1200 W/240V. A thermal fuse 5204 in series with both plates prevents the device from over heating. A single user controlled, variable thermostat 5610 mounted on the lower plate provides a lower plate operating

range of about 180 C to 230 C. A green LED 5620 indicates that the power is on. A red or other LED 5630 indicates that the bottom variable thermostat 5610 has reached the correct temperature and is ready for cooking. The top plate is controlled by a fixed thermostat set to about 235 C. This embodiment dispenses with the need for a top element thermostat. During toasting operations the higher temperature of the top element is moderated because the top cooking surface 110 has ribs 4910.

While the present invention has been described with reference to particular examples, embodiments and details of construction, these should be understood as having been provided by way of example and not as limitations to the scope of spirit or the invention.

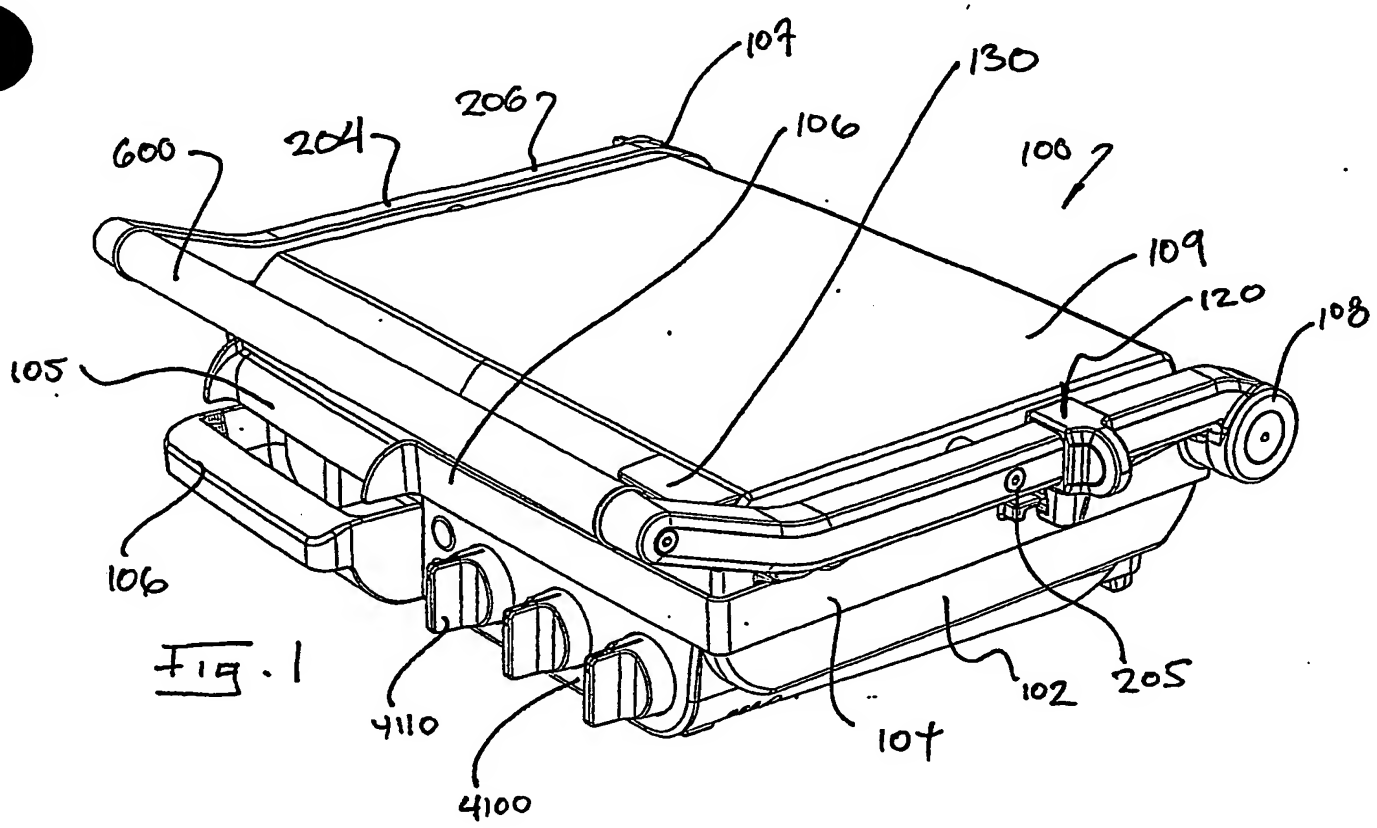
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Fig. 1

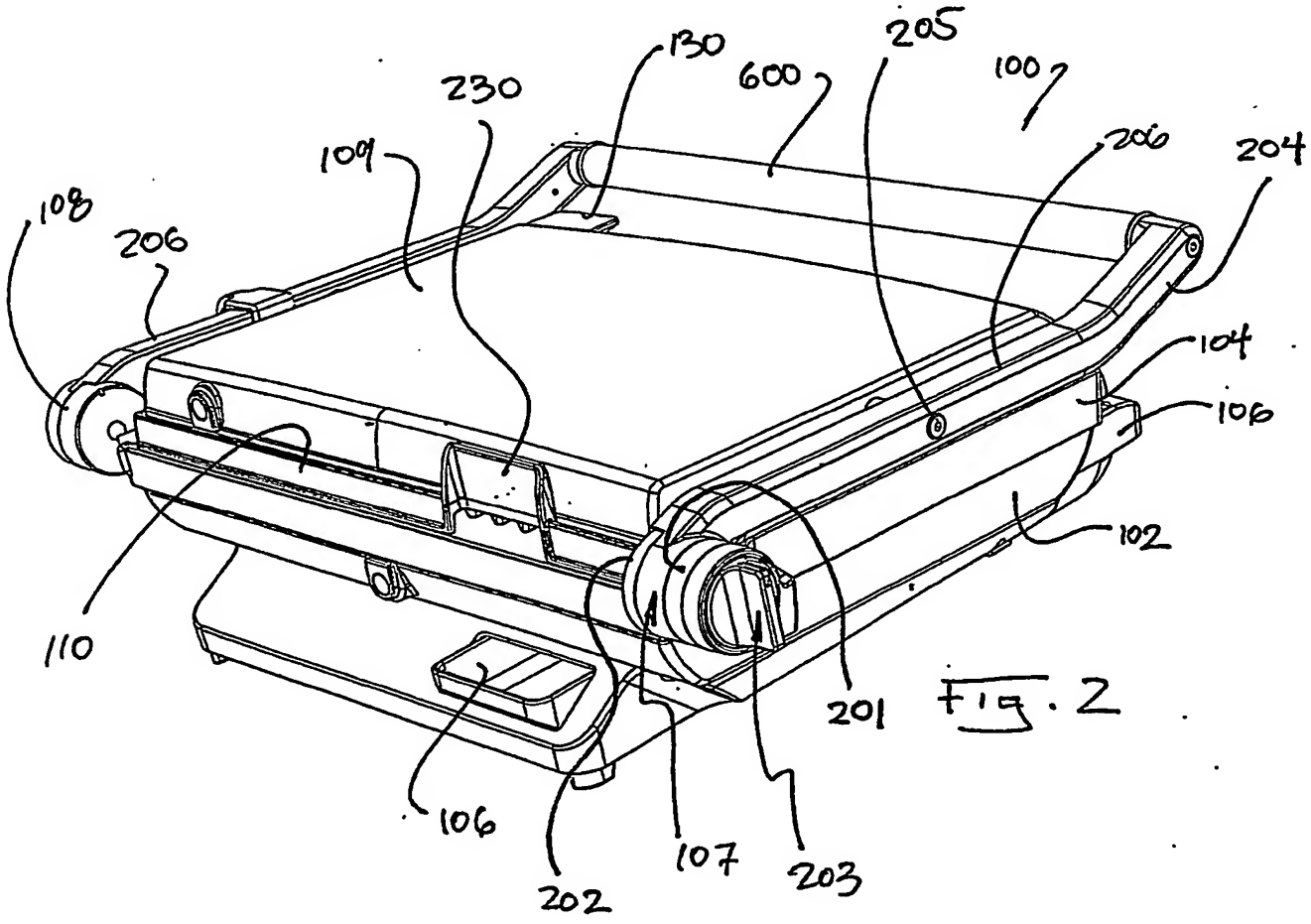
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Fig. 2

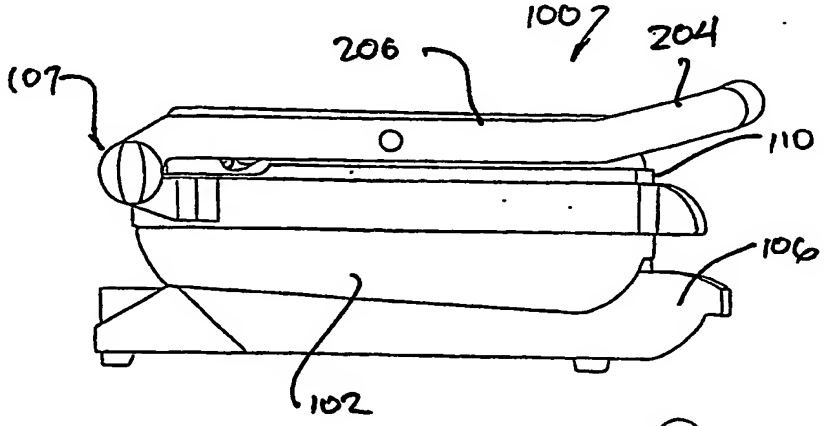

Fig. 3

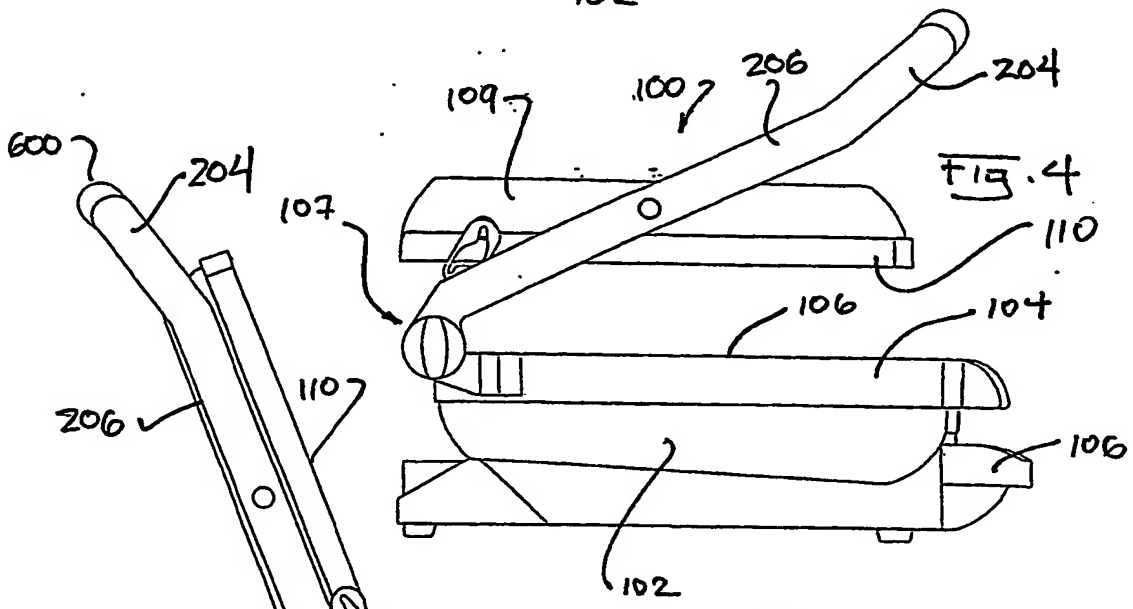

Fig. 4

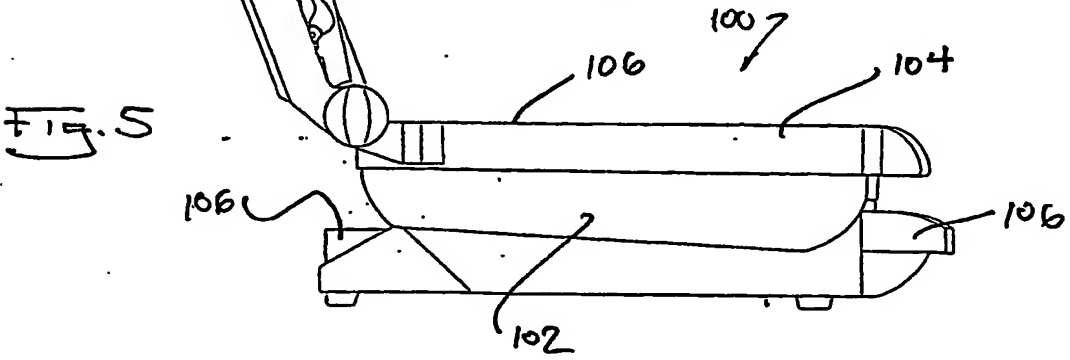

Fig. 5

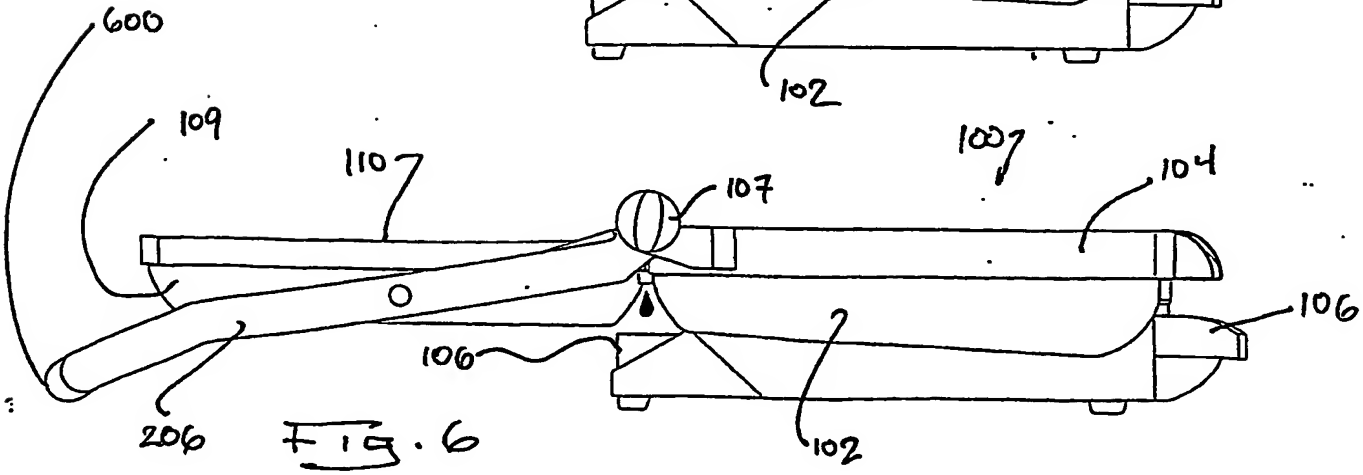

Fig. 6

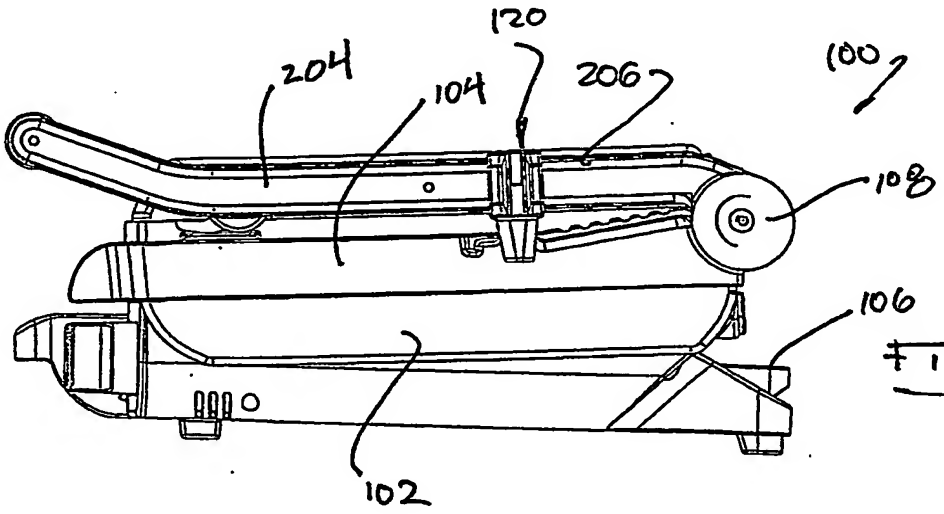
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Fig. 7

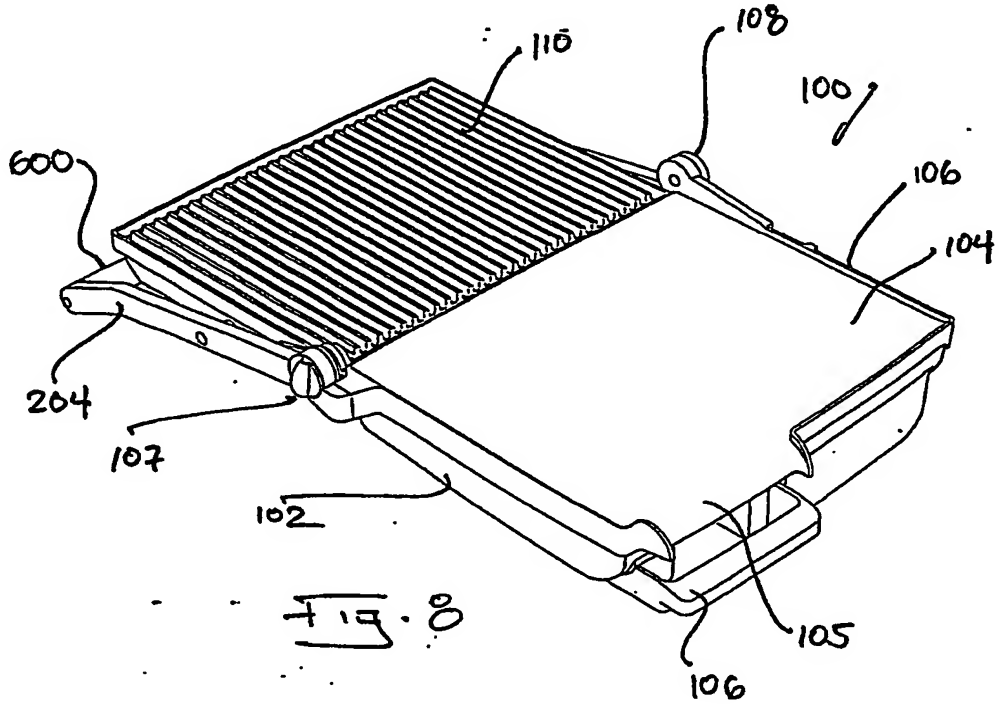
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Fig. 8

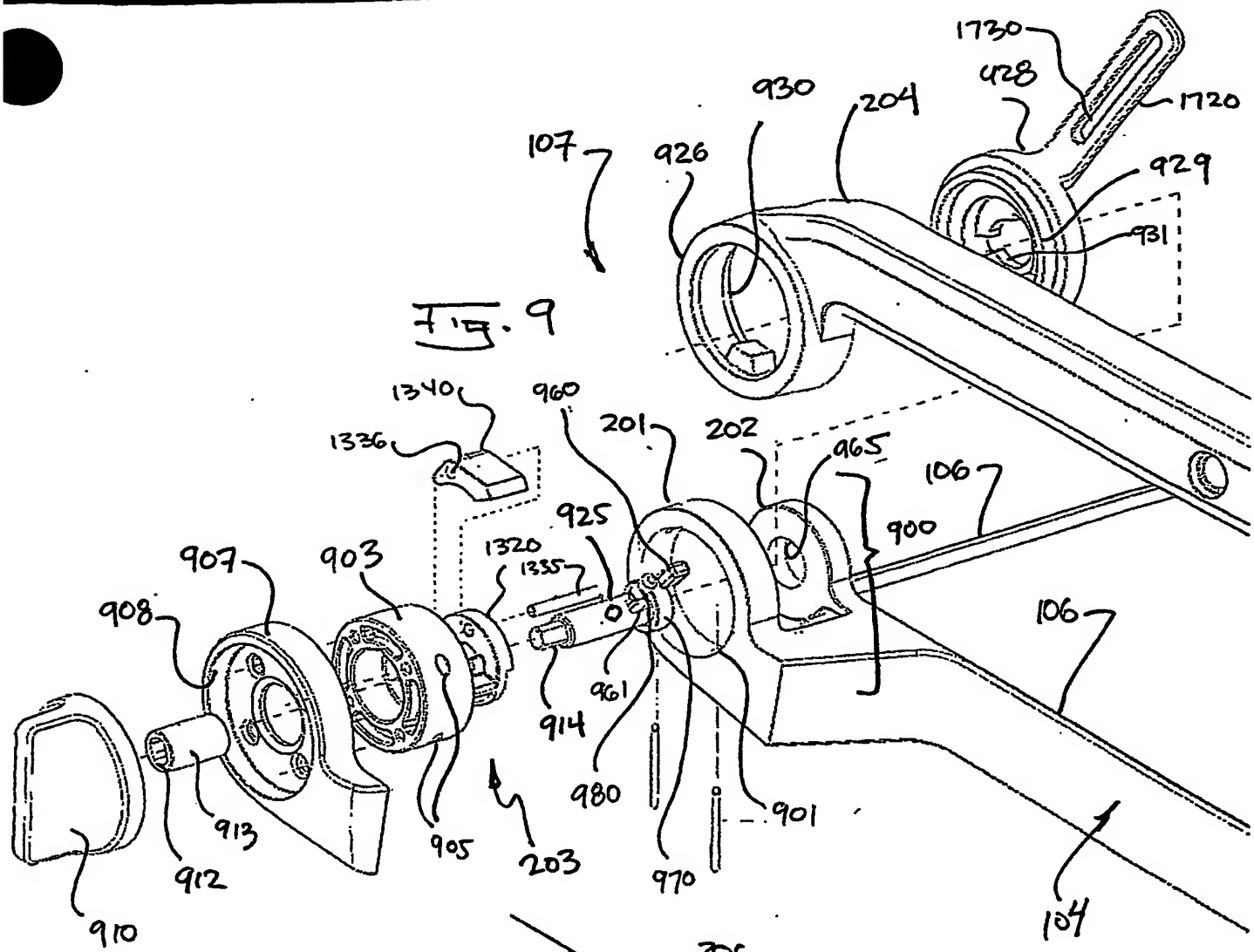
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Fig. 9

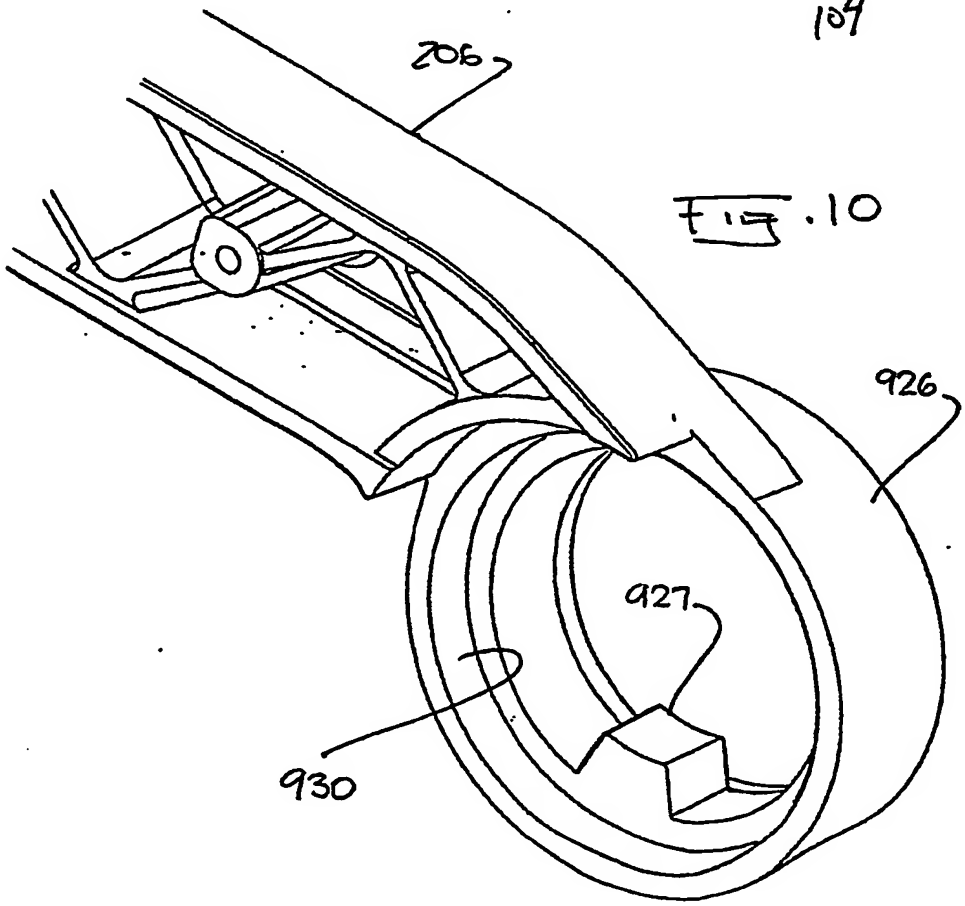
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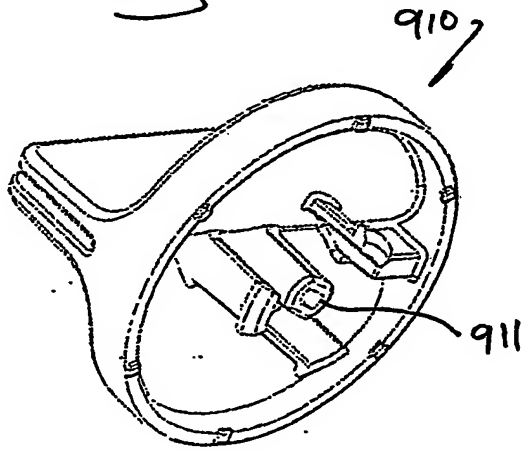
Fig. 10

Fig. 11



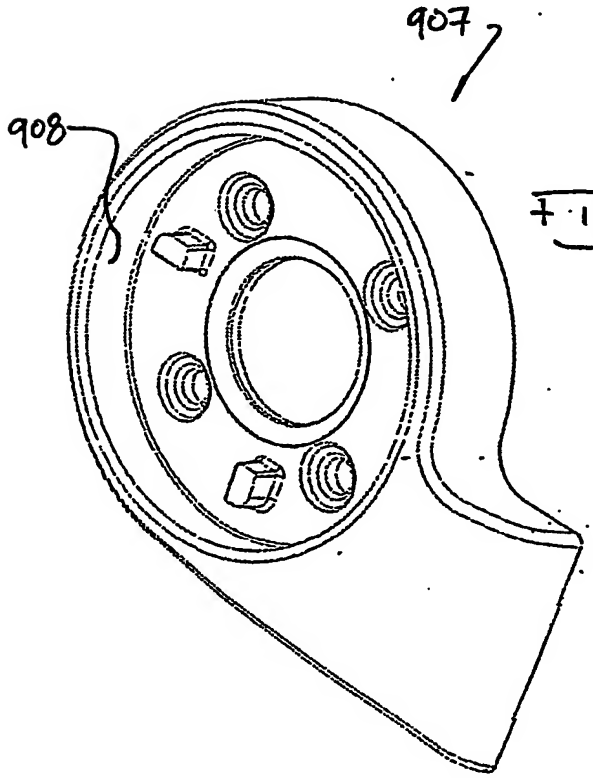


Fig 12

Fig. 13

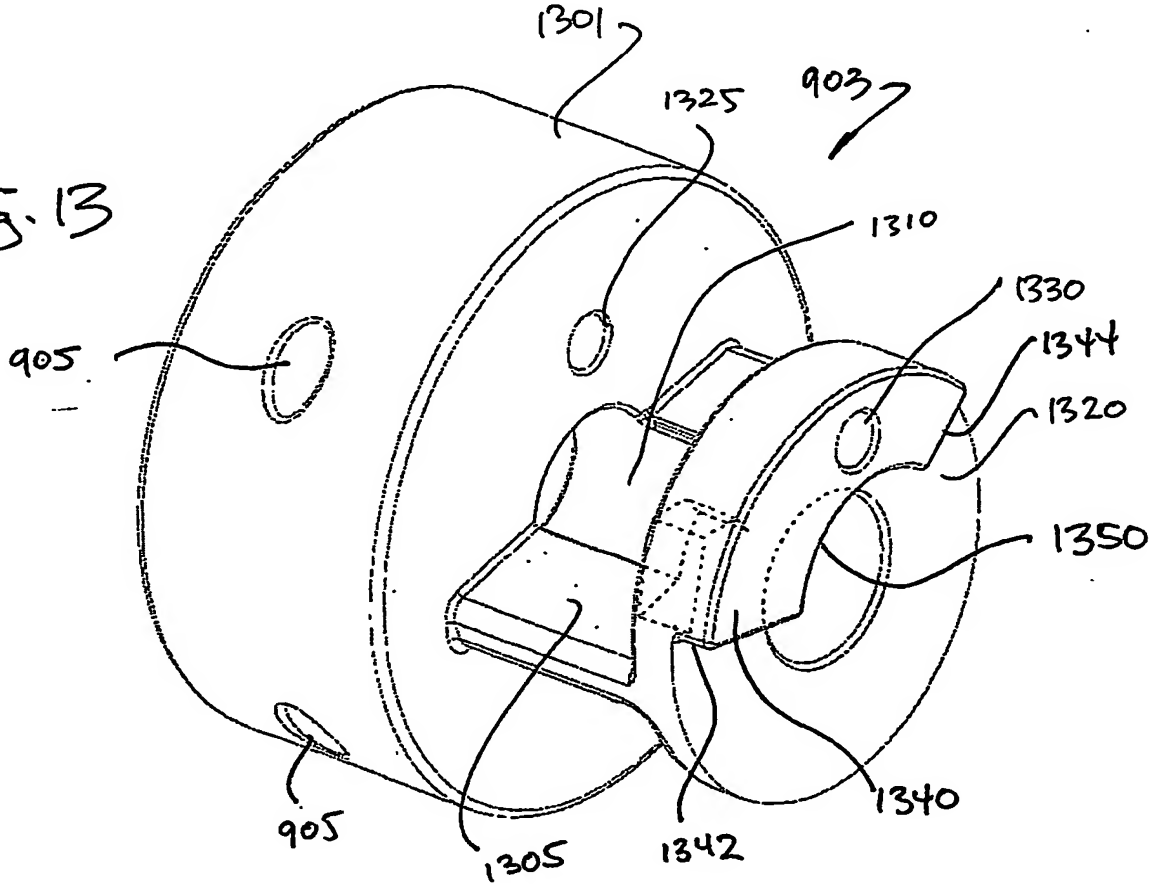

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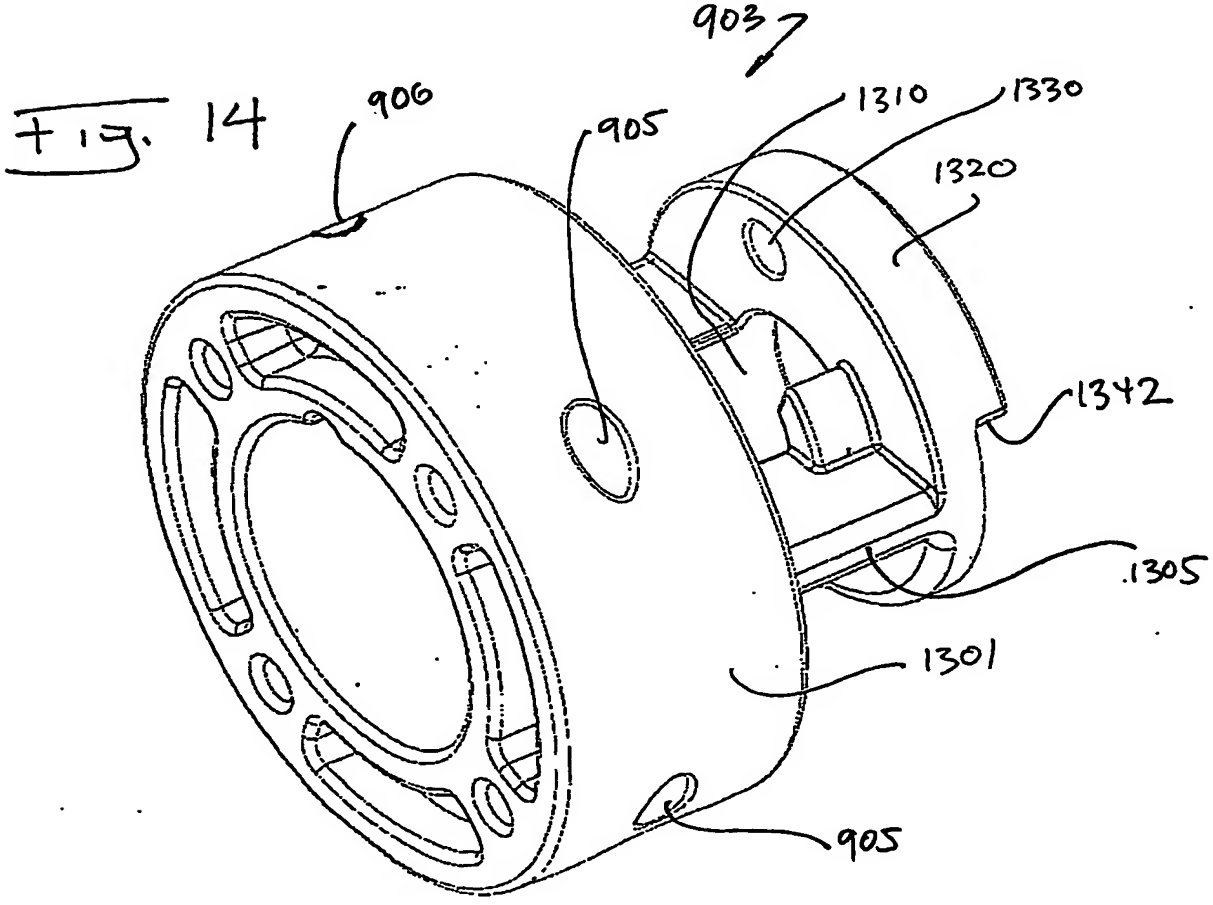
Fig. 14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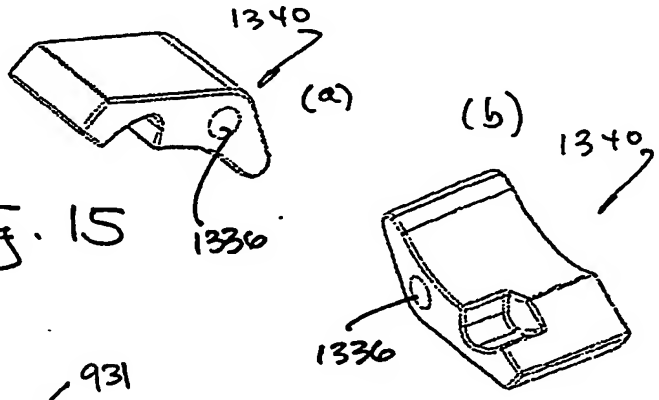


Fig. 15

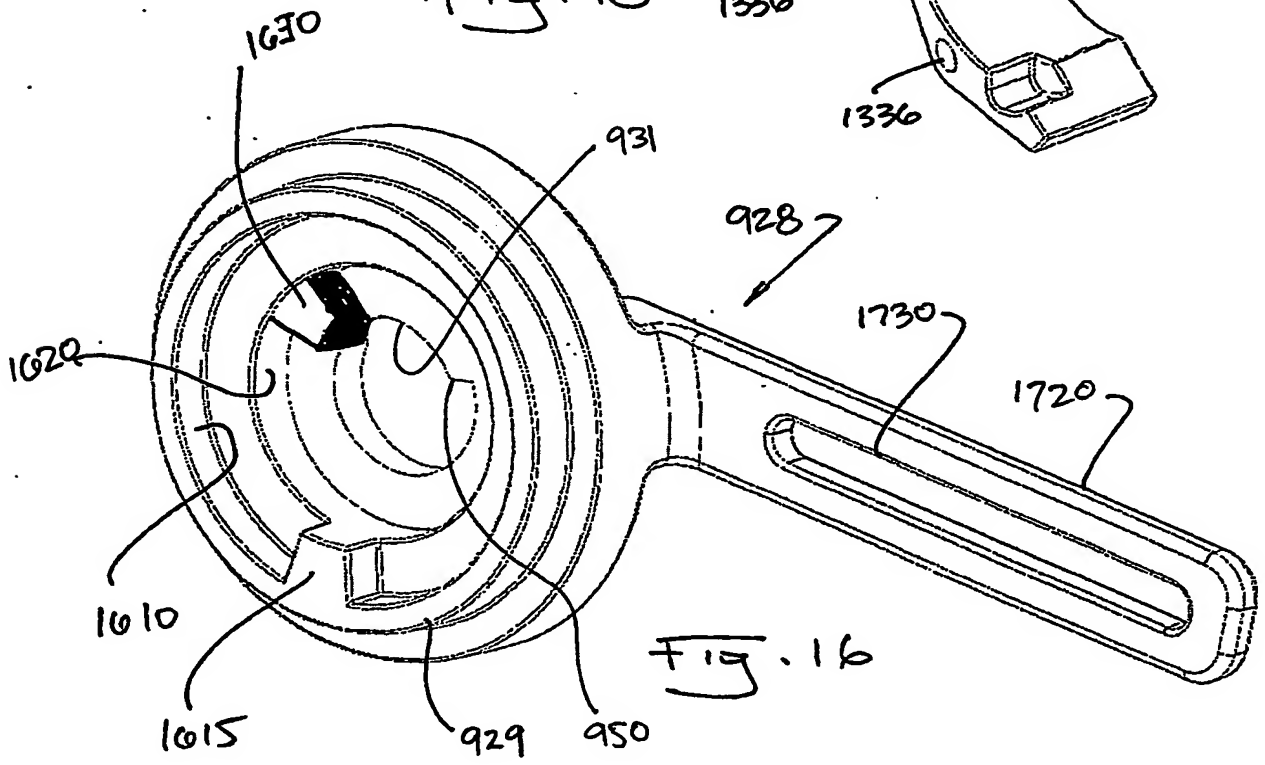


Fig. 16

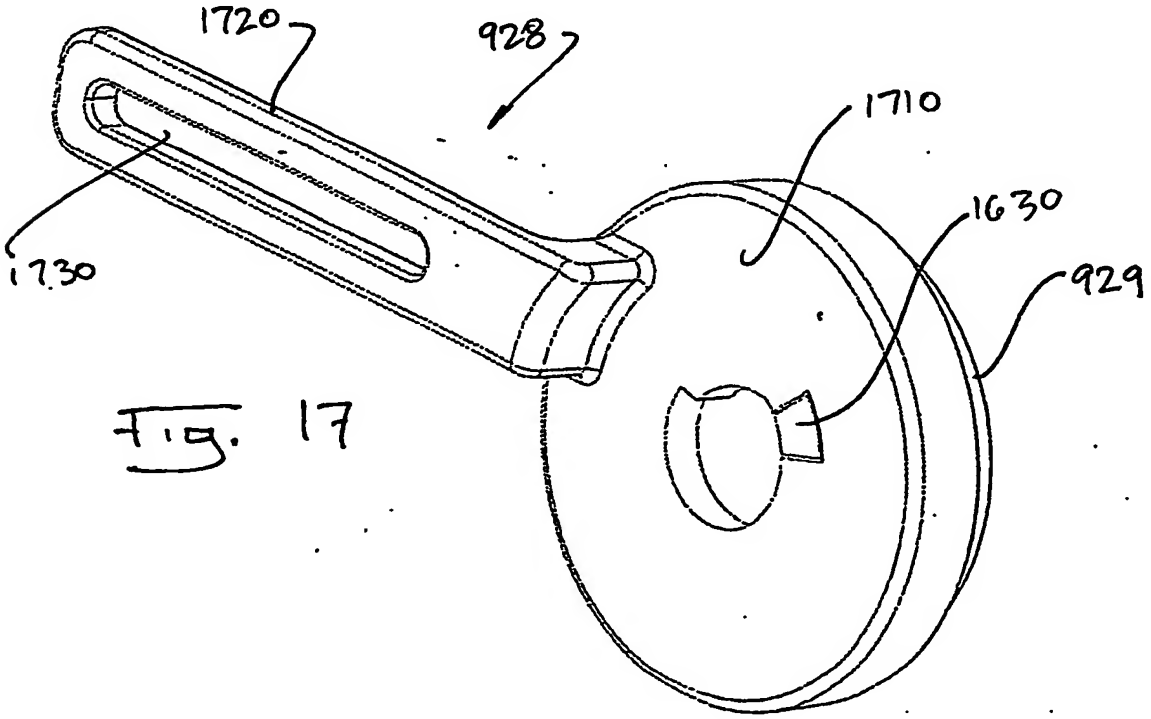


Fig. 17

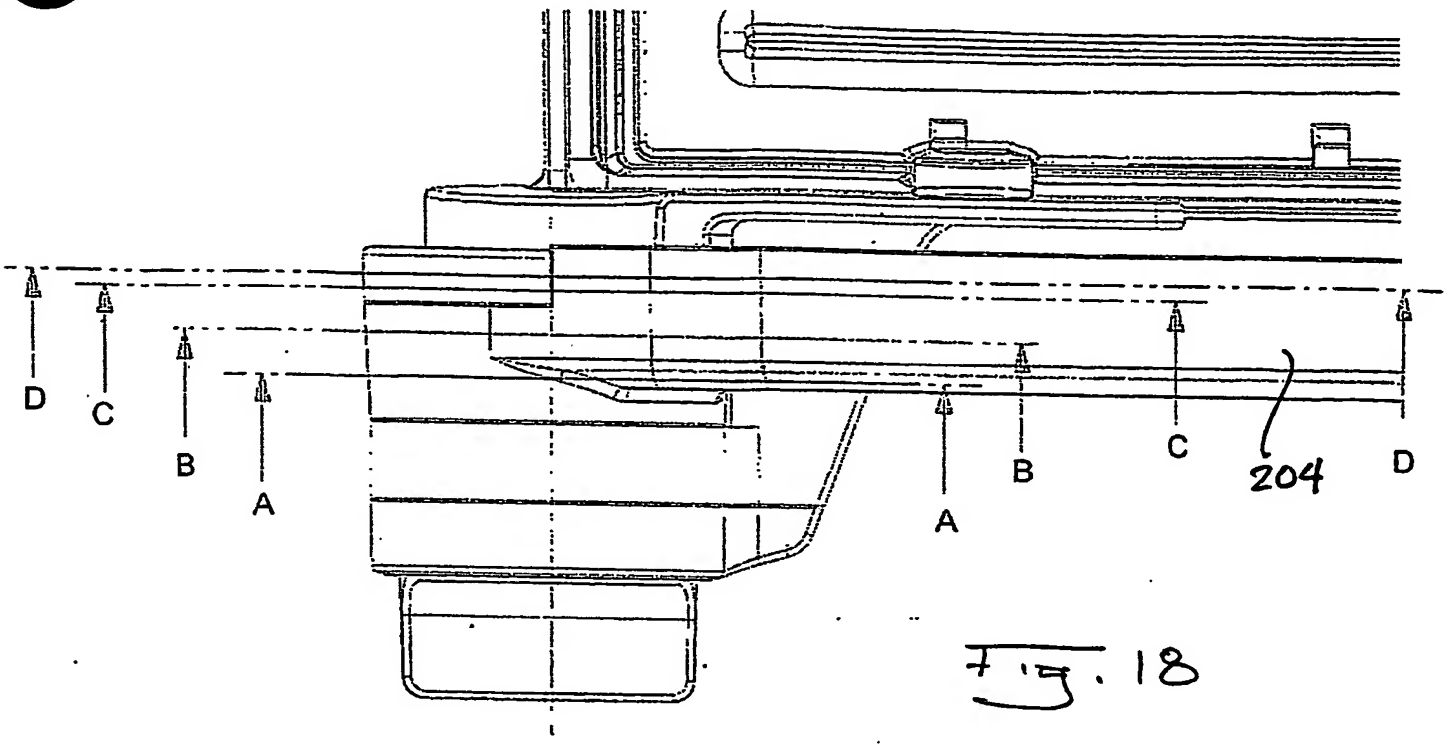


Fig. 18

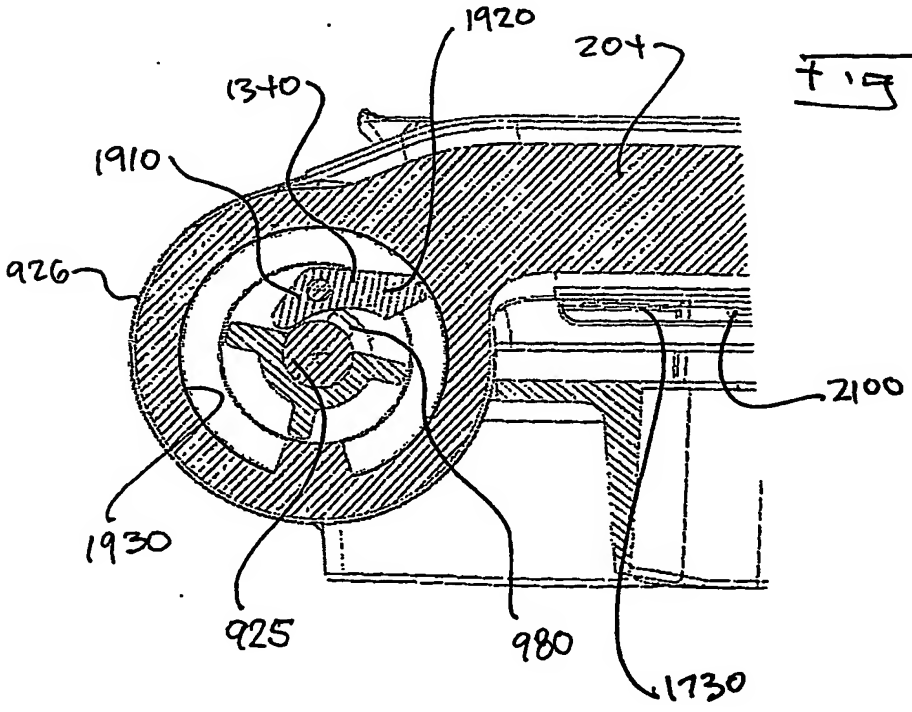


Fig. 19

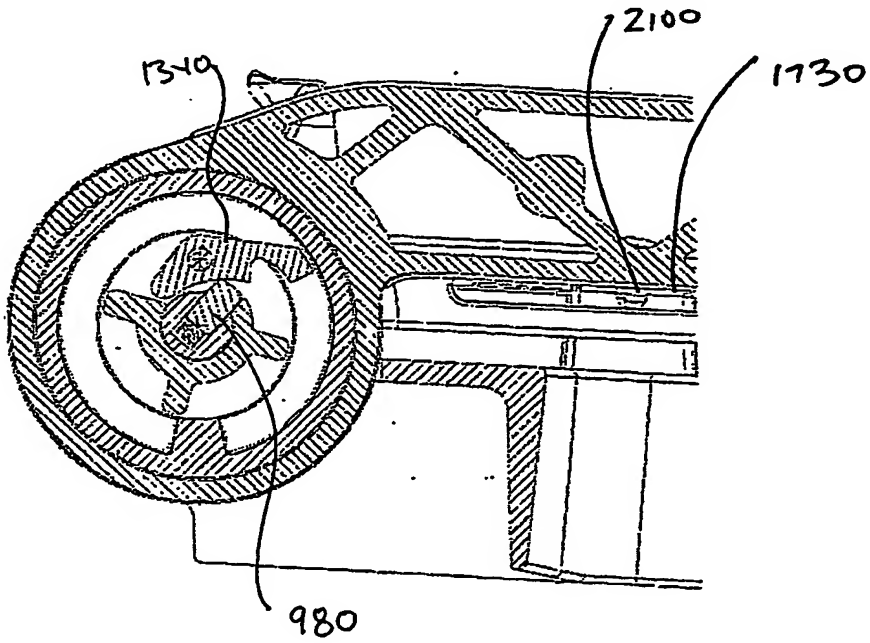
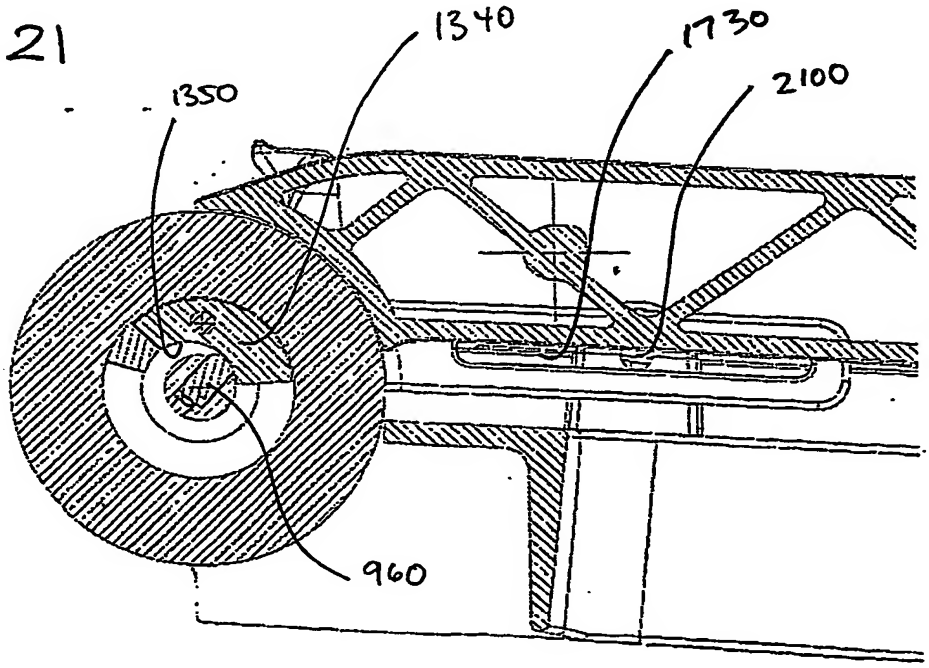


Fig. 20

Fig. 21



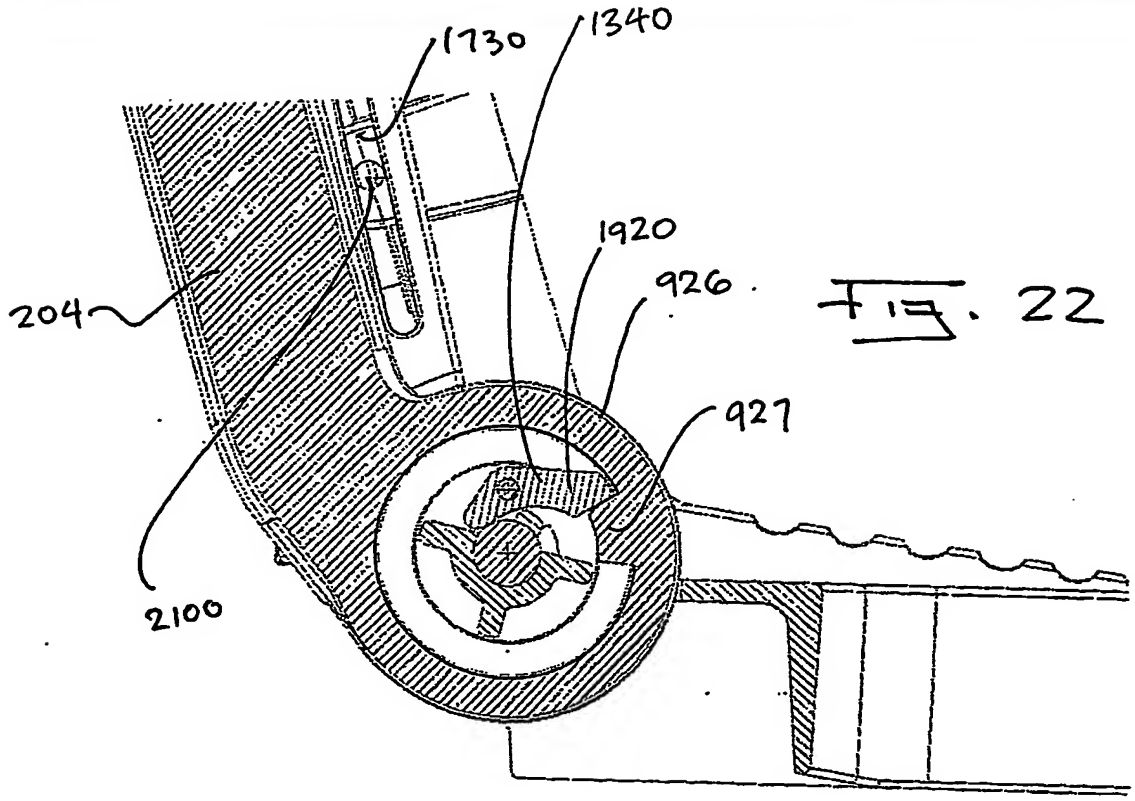


Fig. 22

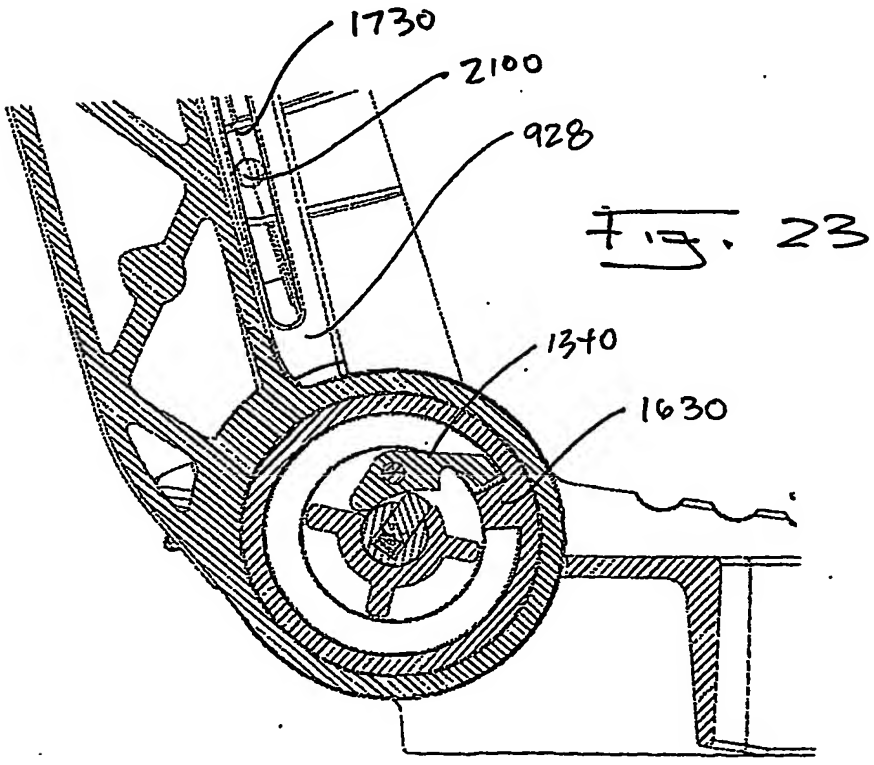


Fig. 23

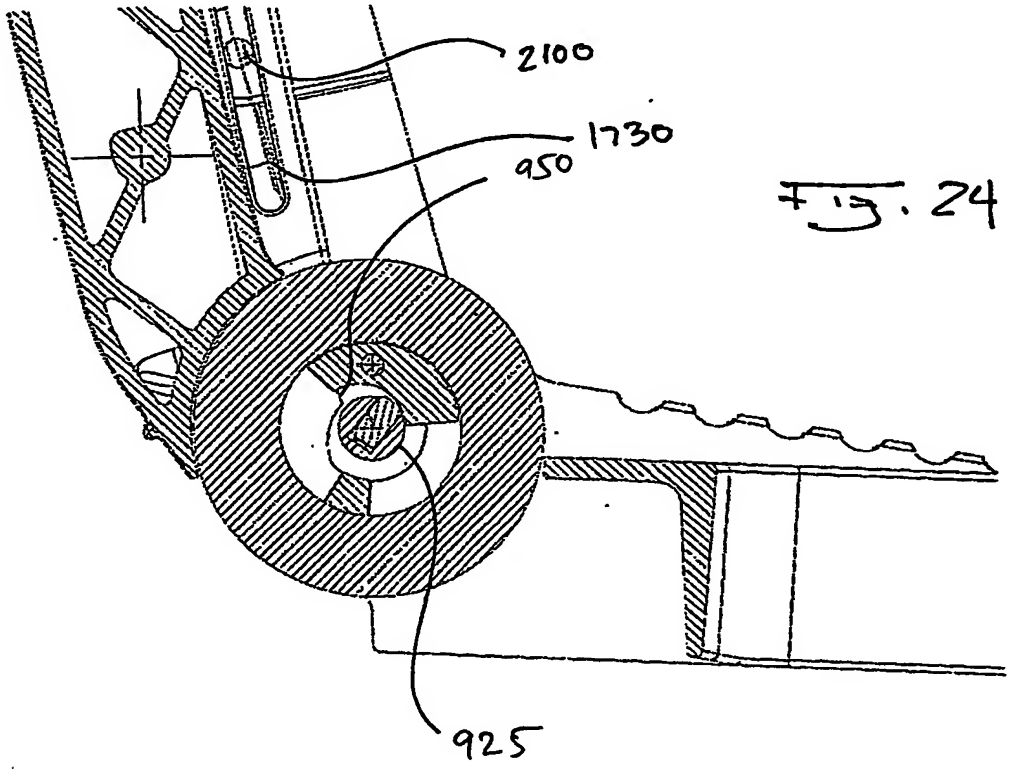


Fig. 24

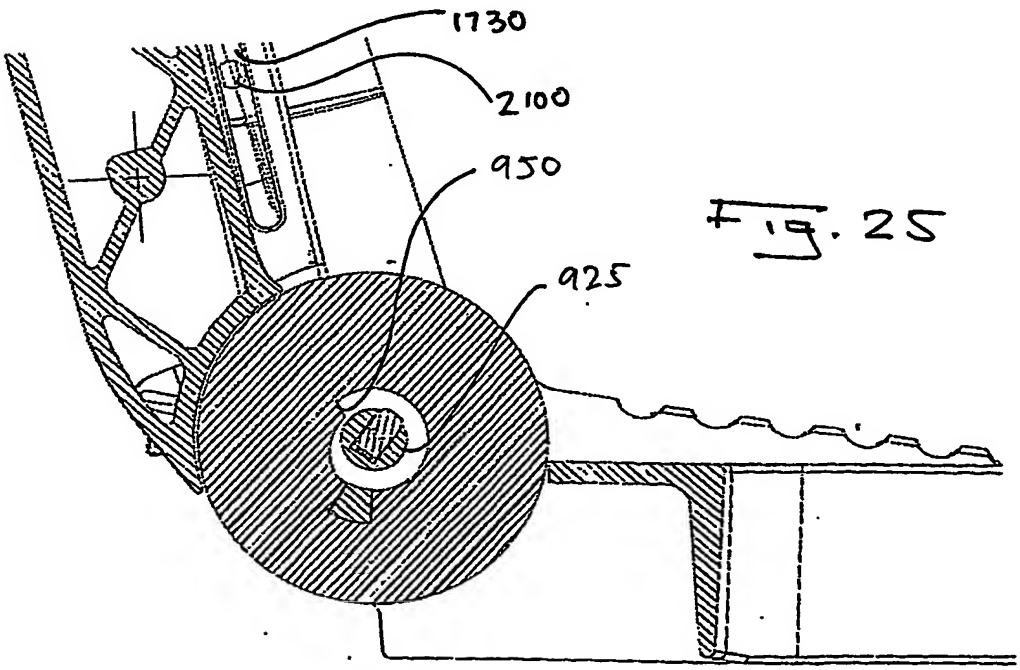


Fig. 25

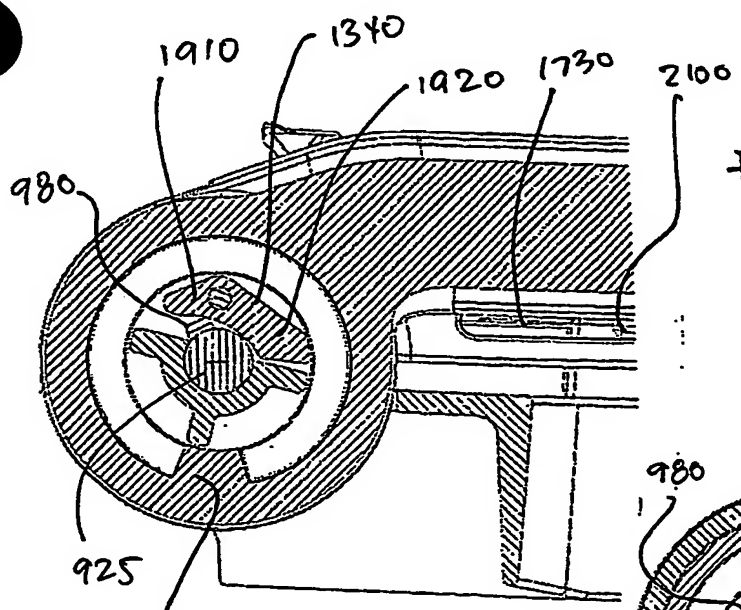
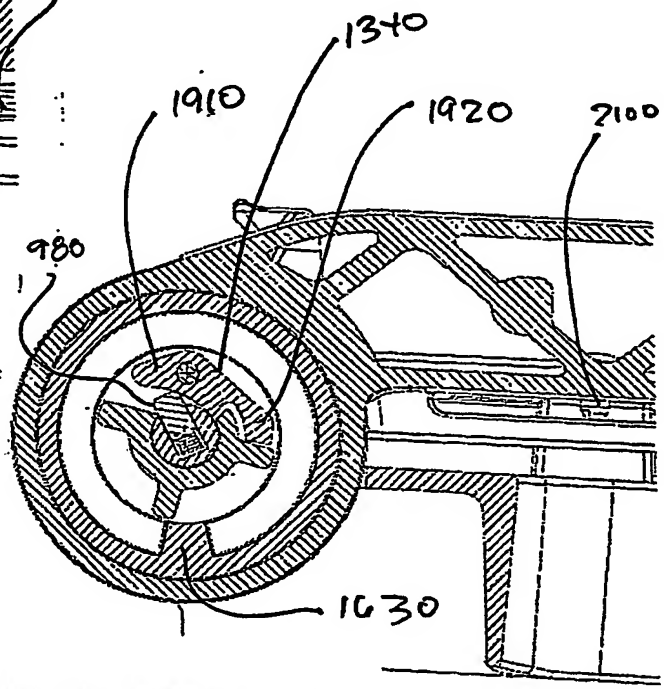


Fig. 26

Fig. 27



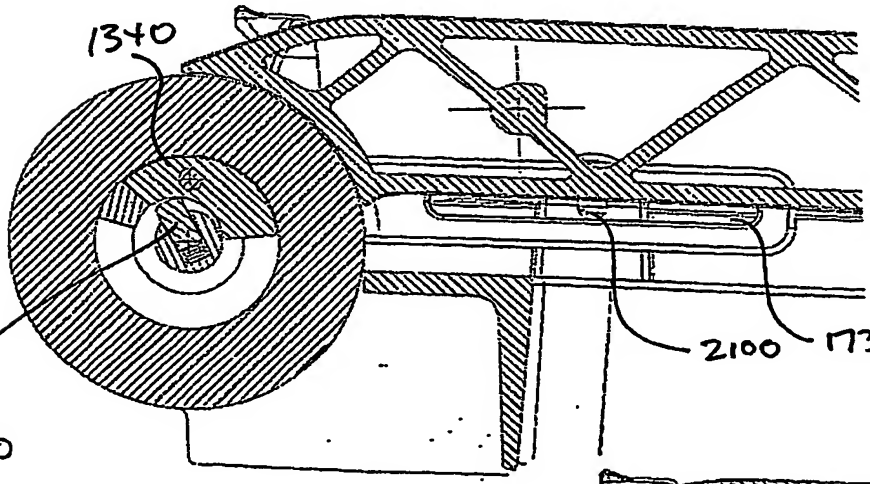


Fig. 28

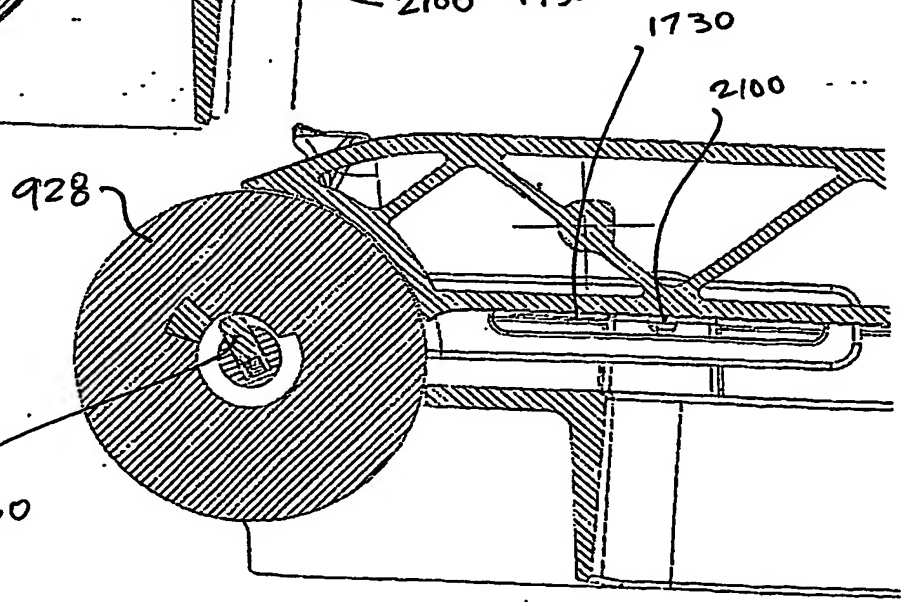


Fig. 29

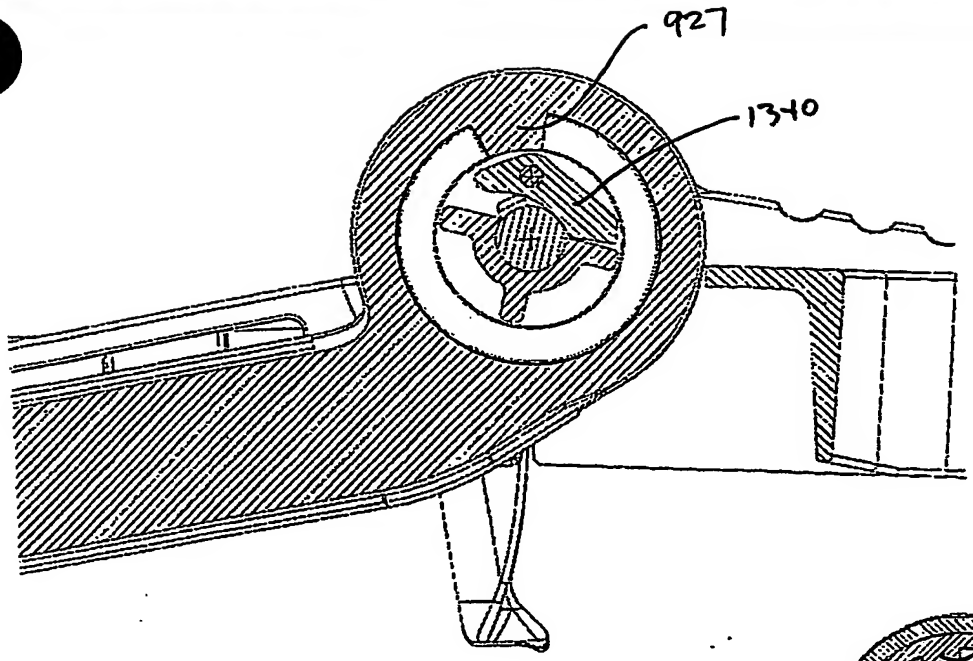


Fig. 30

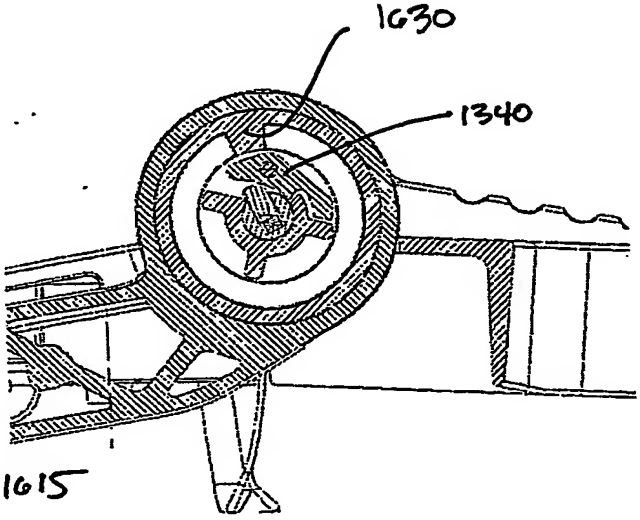


Fig. 31

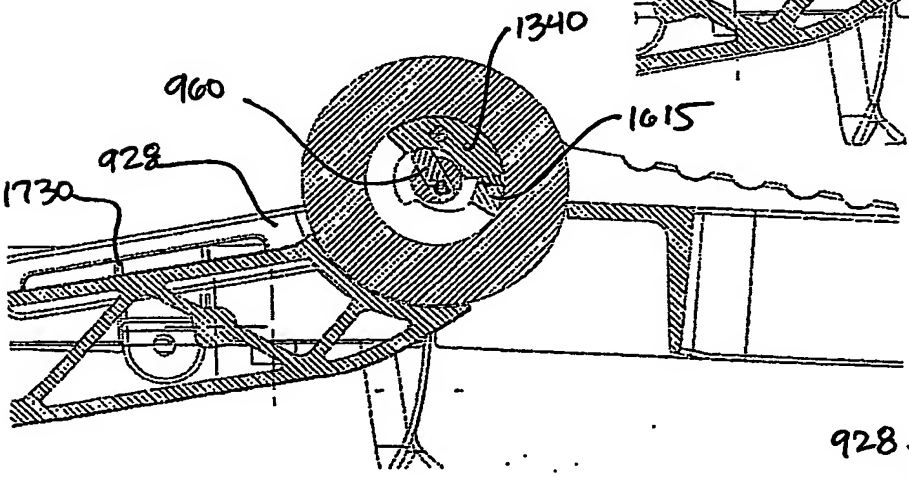


Fig. 32

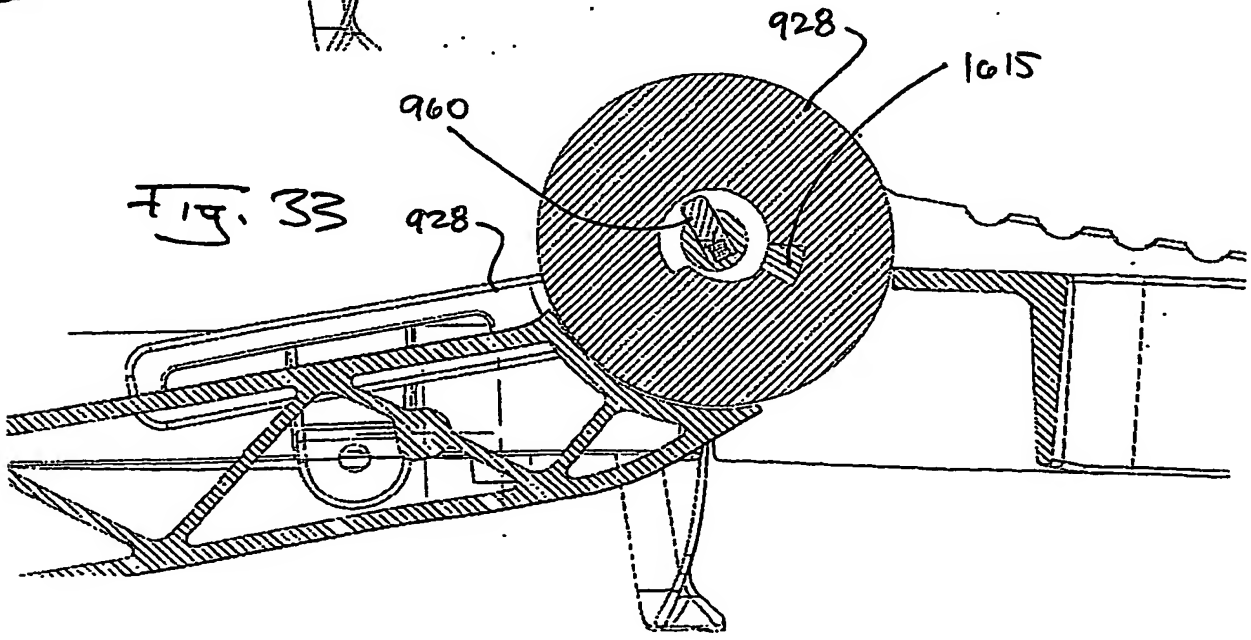


Fig. 33

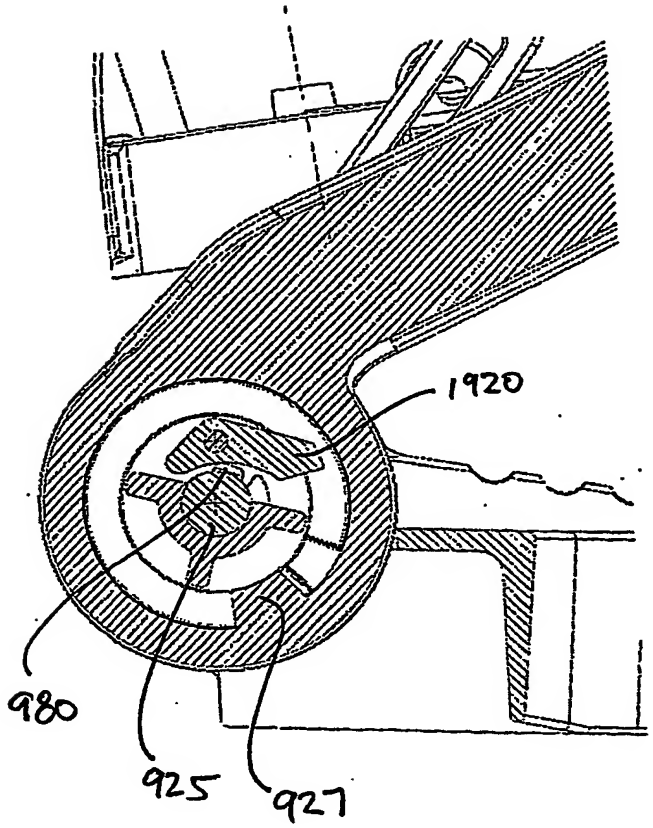


Fig. 34

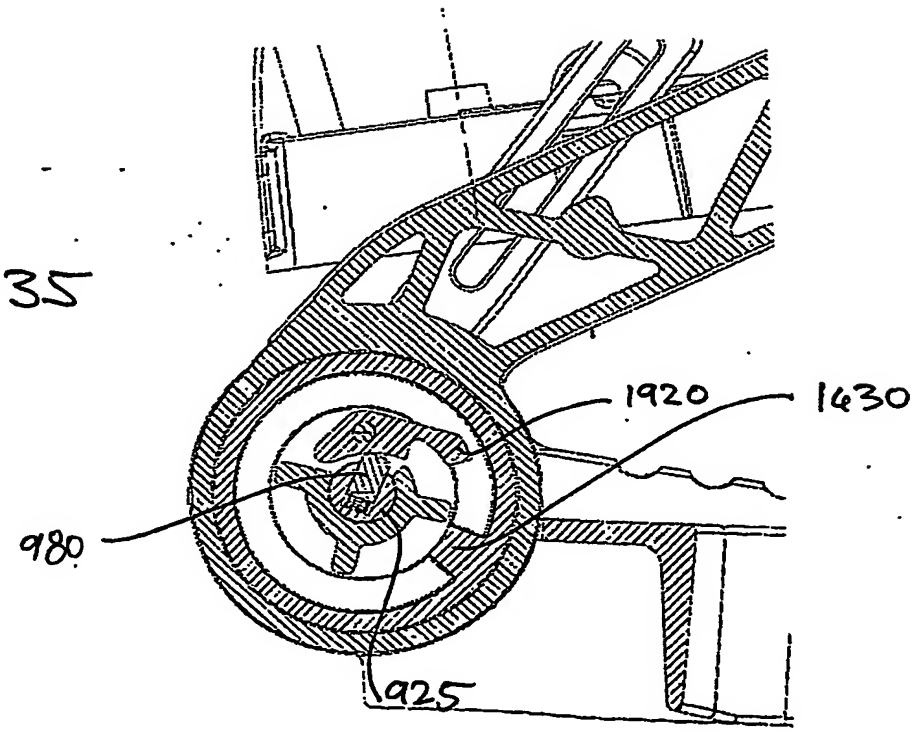


Fig. 35

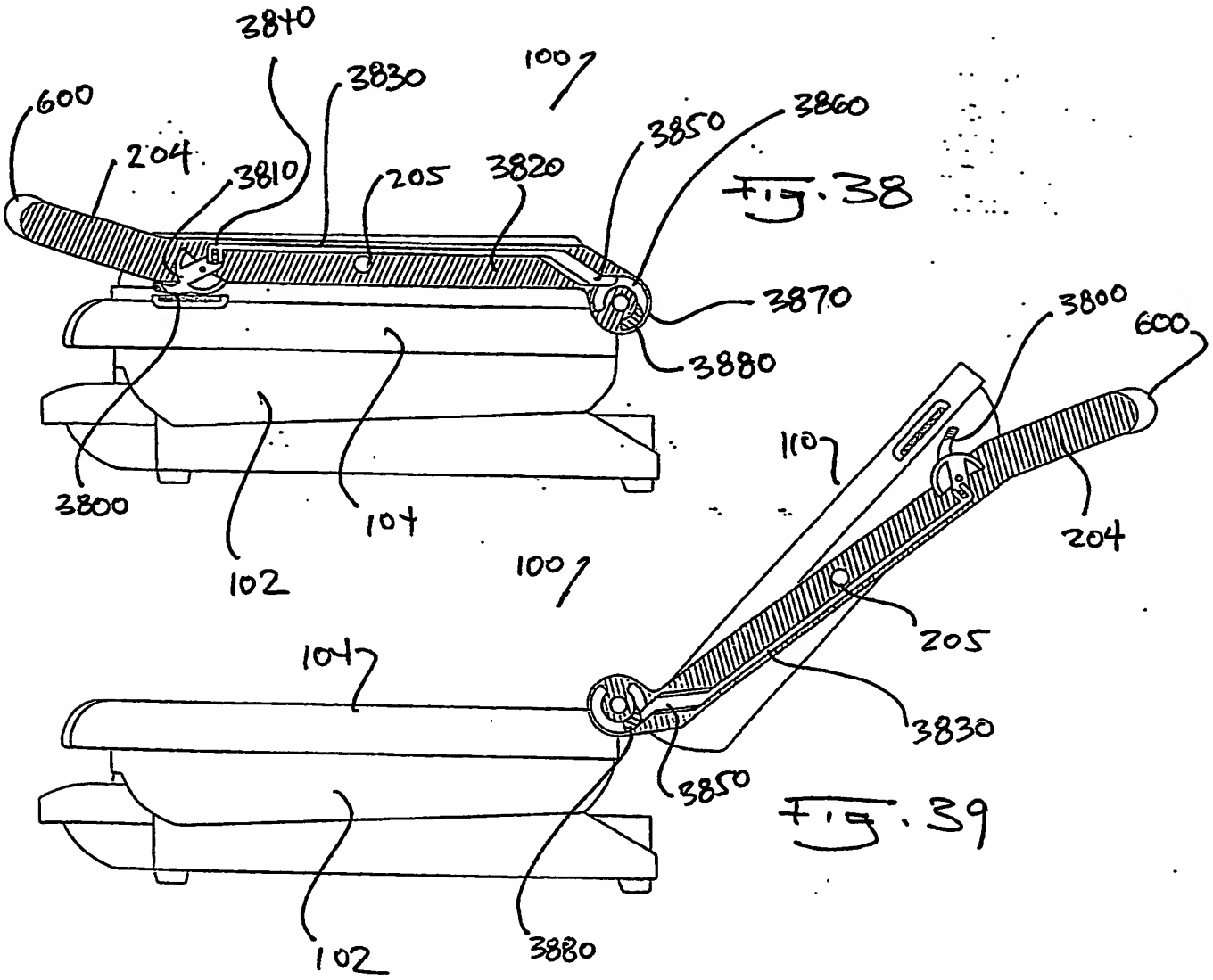


Fig. 38

Fig. 39

Fig. 40

Fig. 41

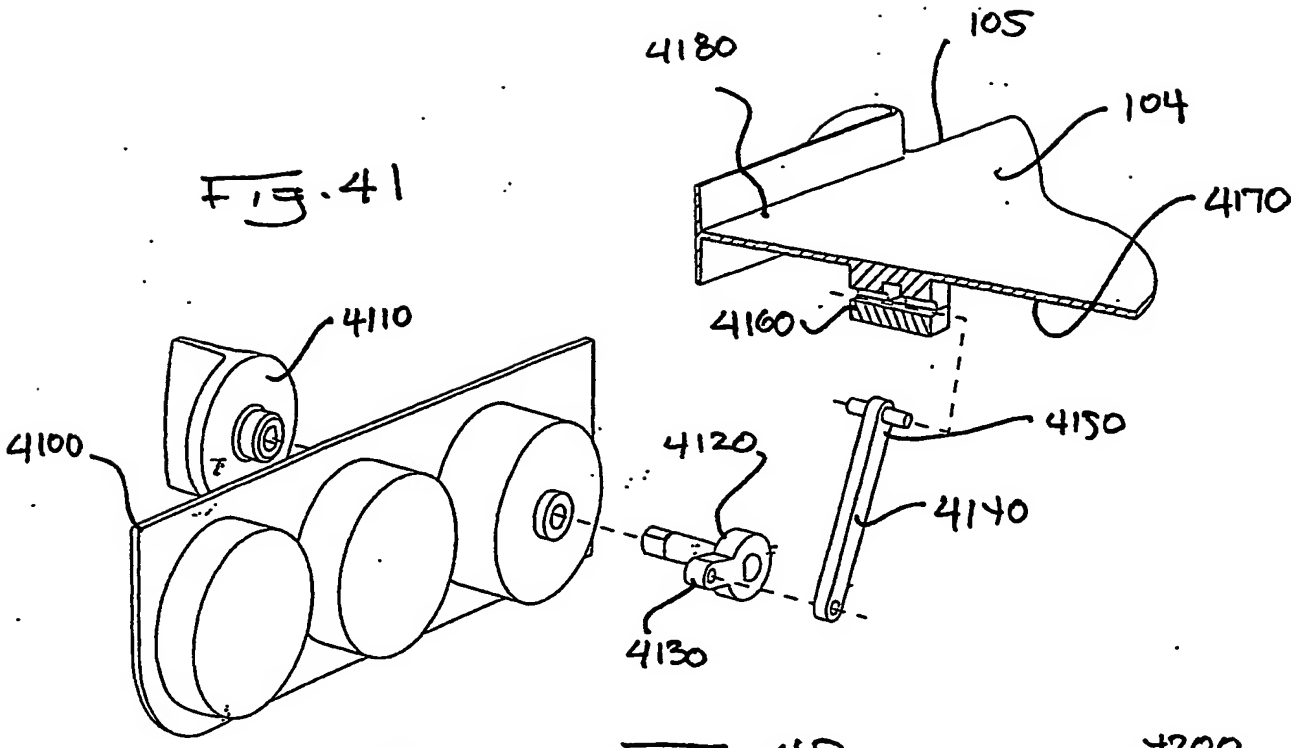


Fig. 42

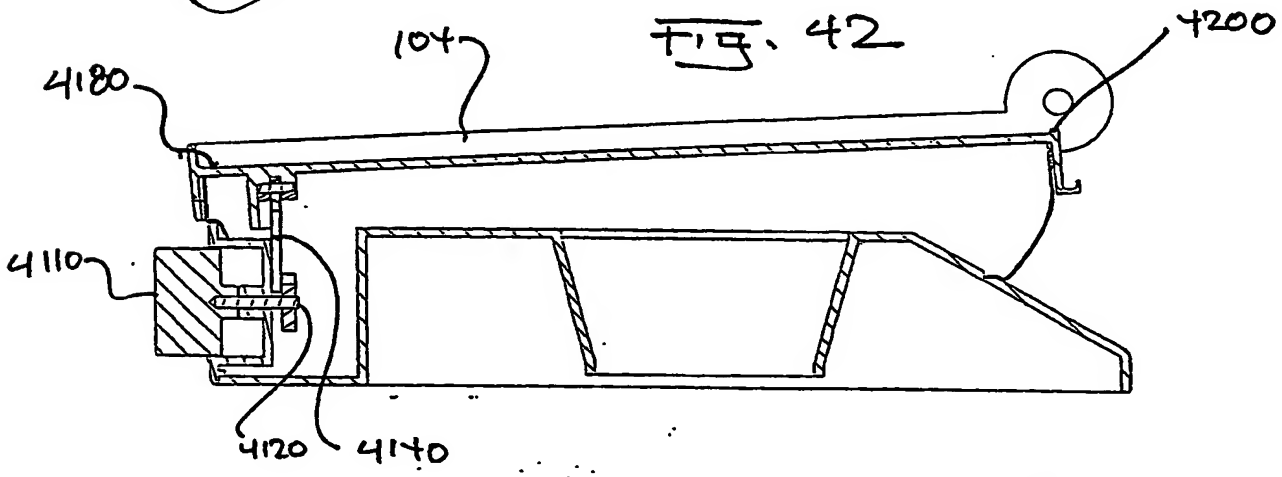
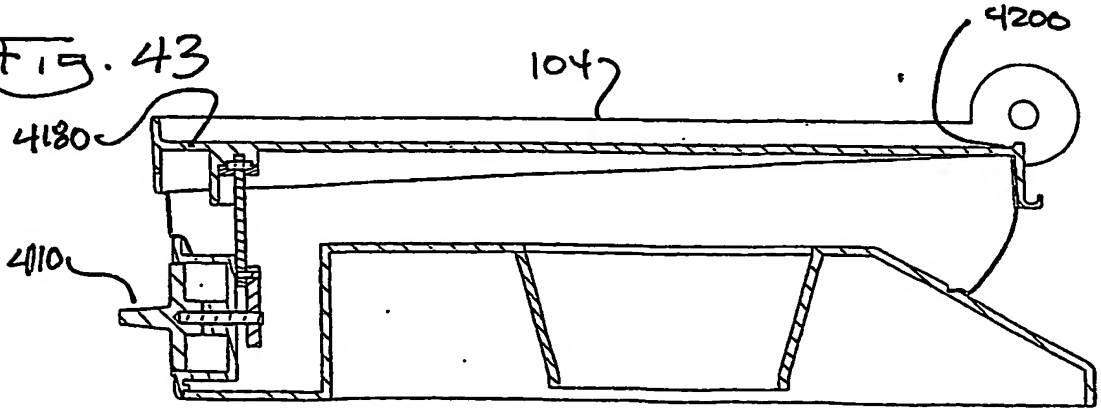


Fig. 43



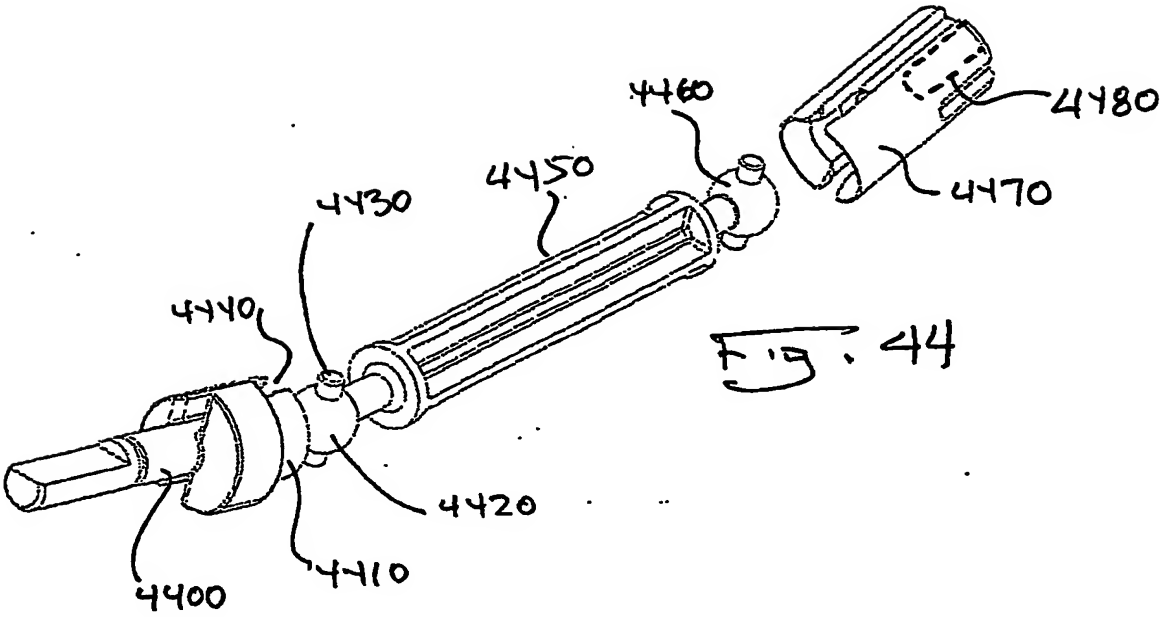

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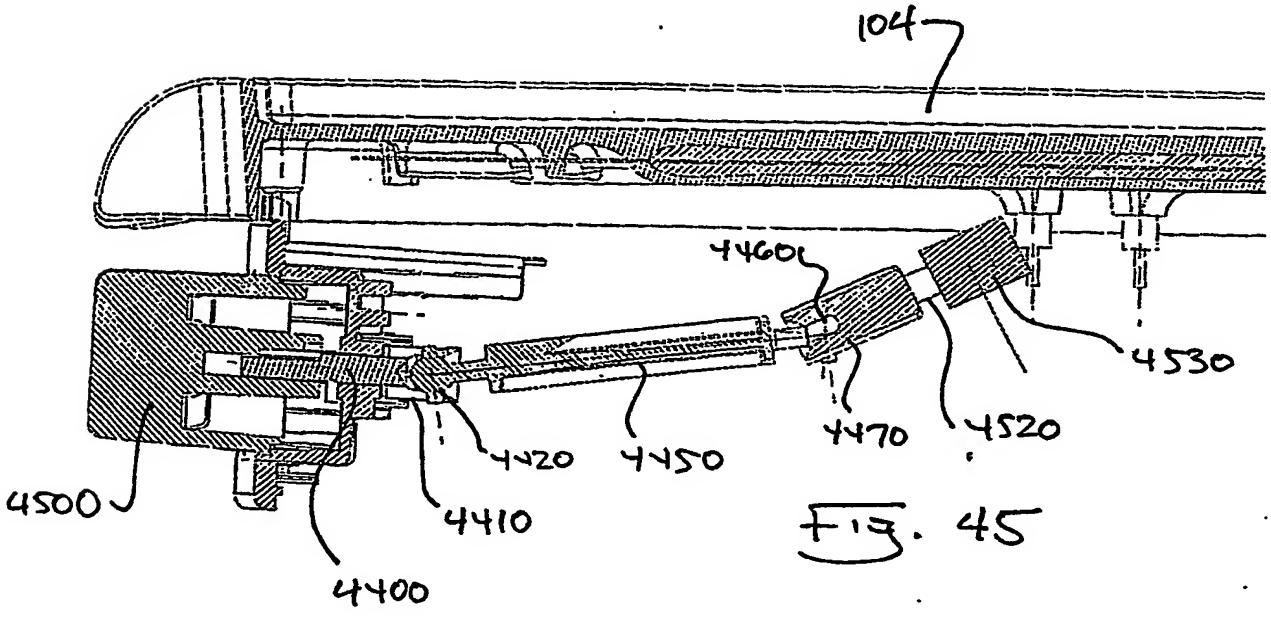
Fig. 44


104
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4500
4410
4400

Fig. 45

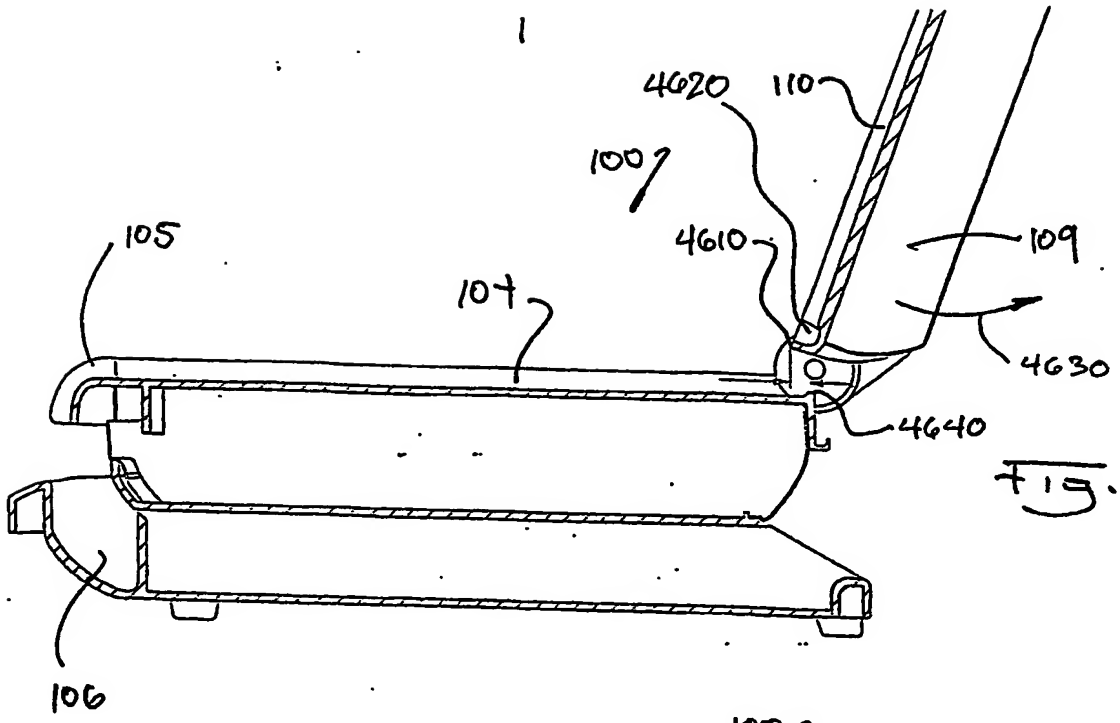


Fig. 46

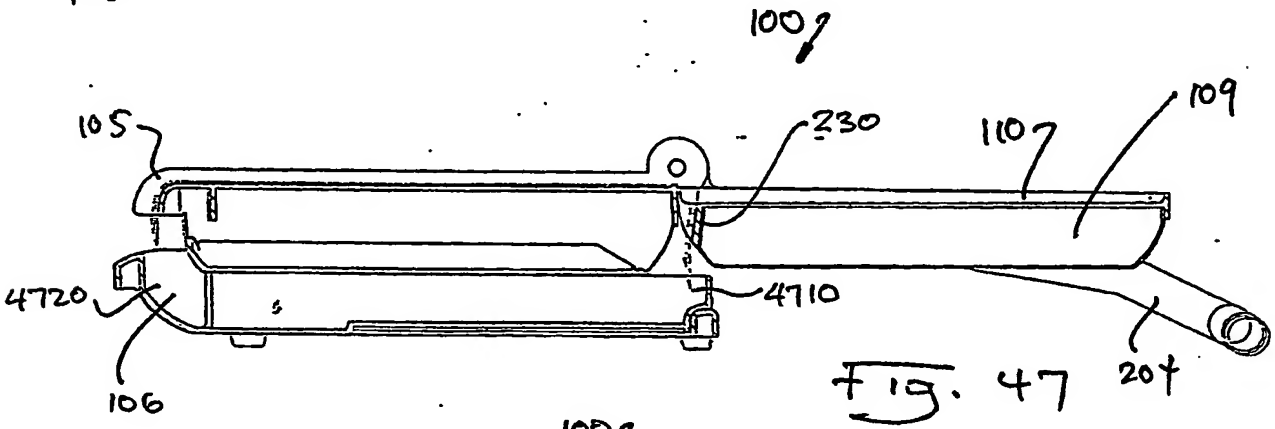


Fig. 47

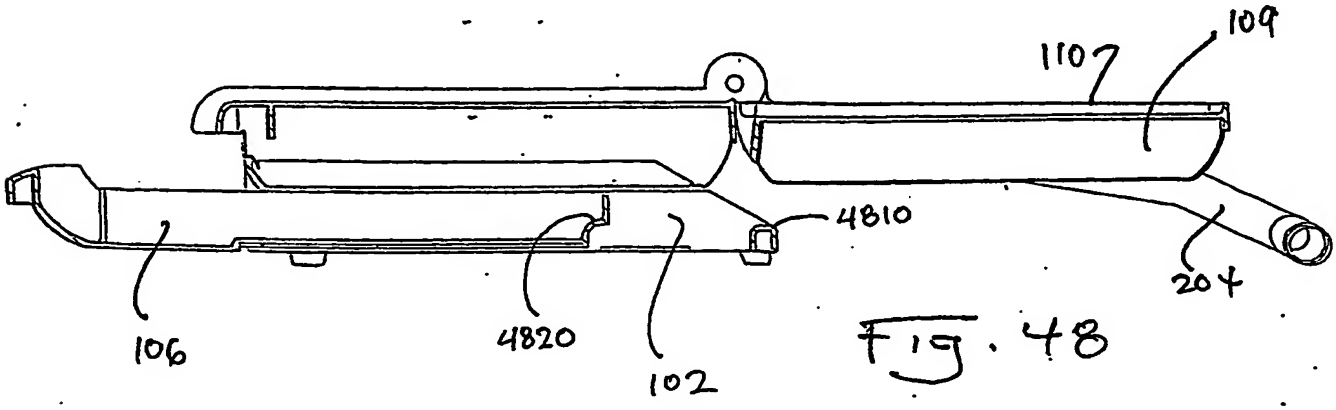
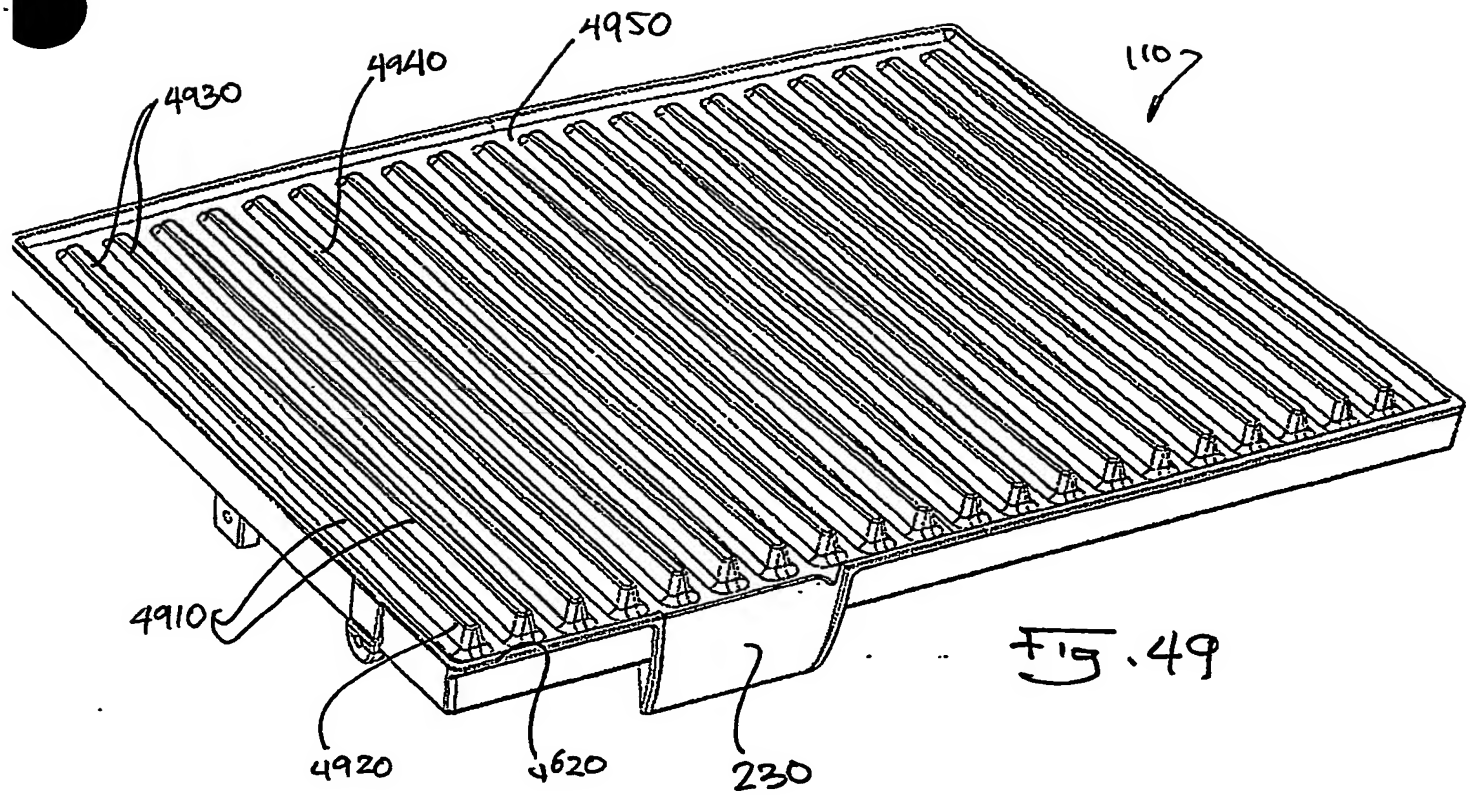


Fig. 48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1107
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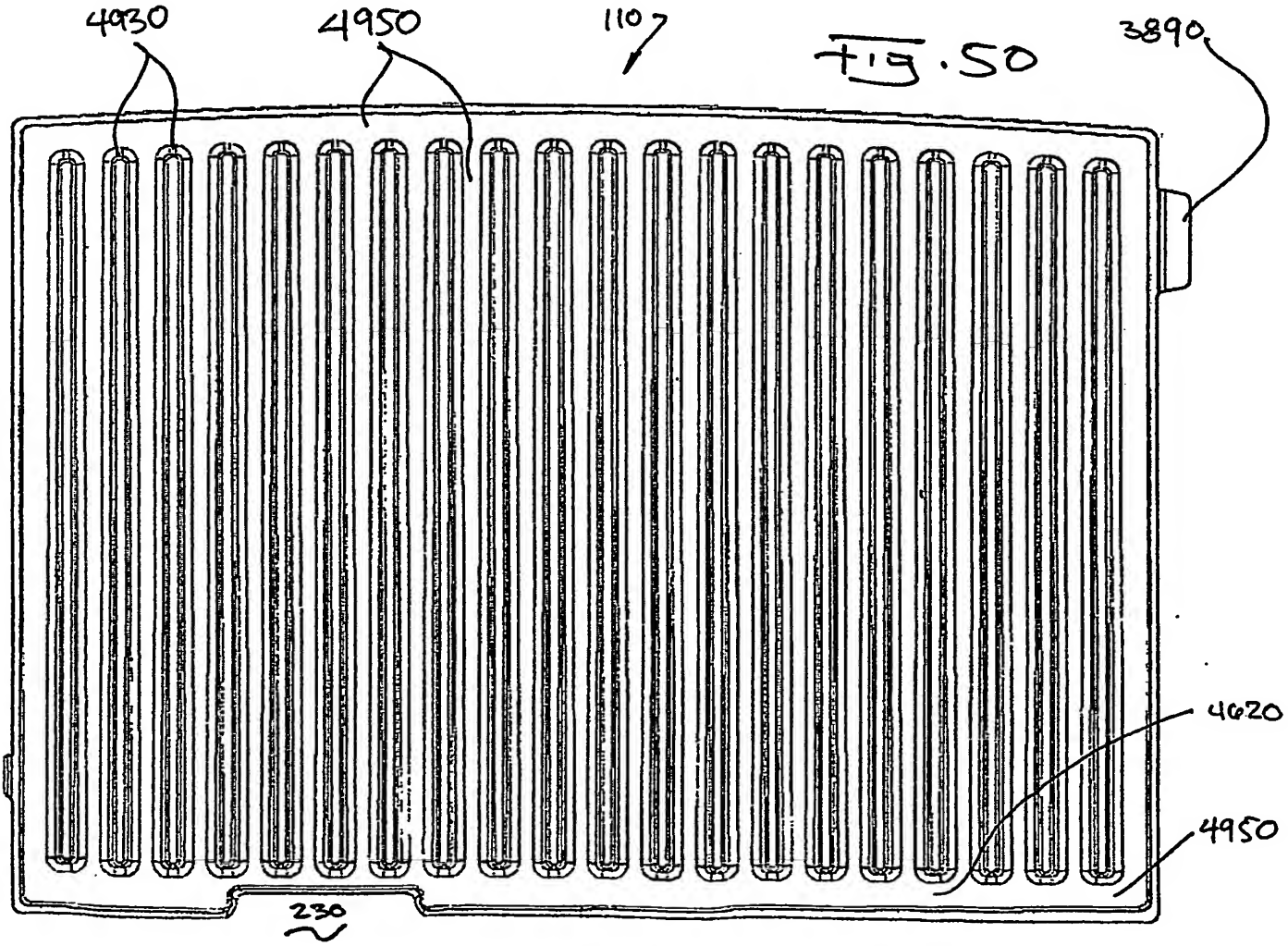
4620
230

Fig. 49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1107
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4950
230

Fig. 50

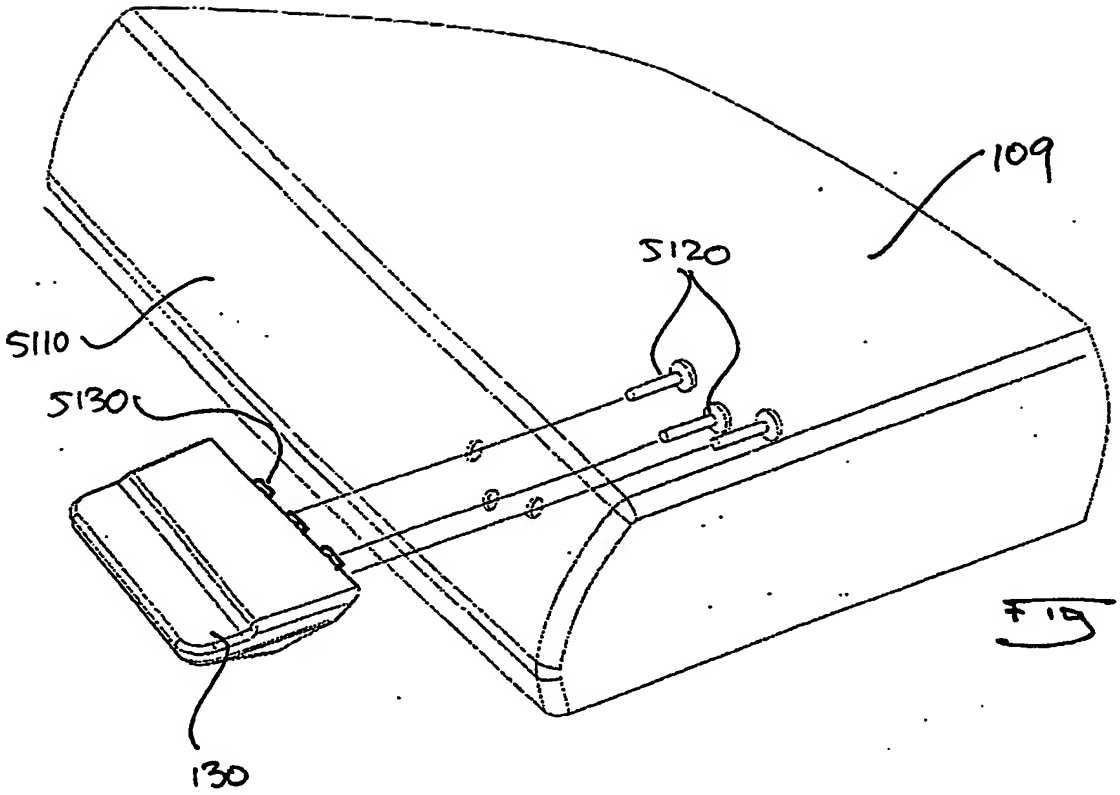

FIG. 51

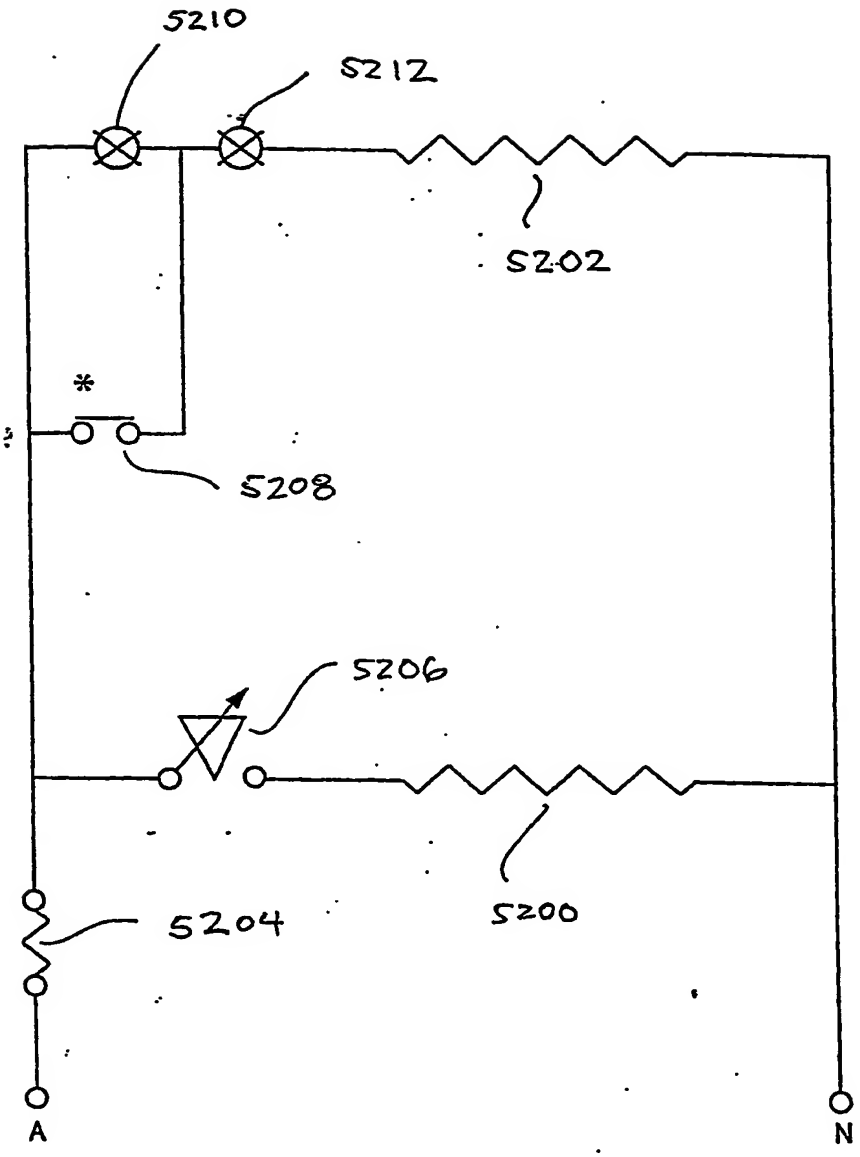

Fig. 52

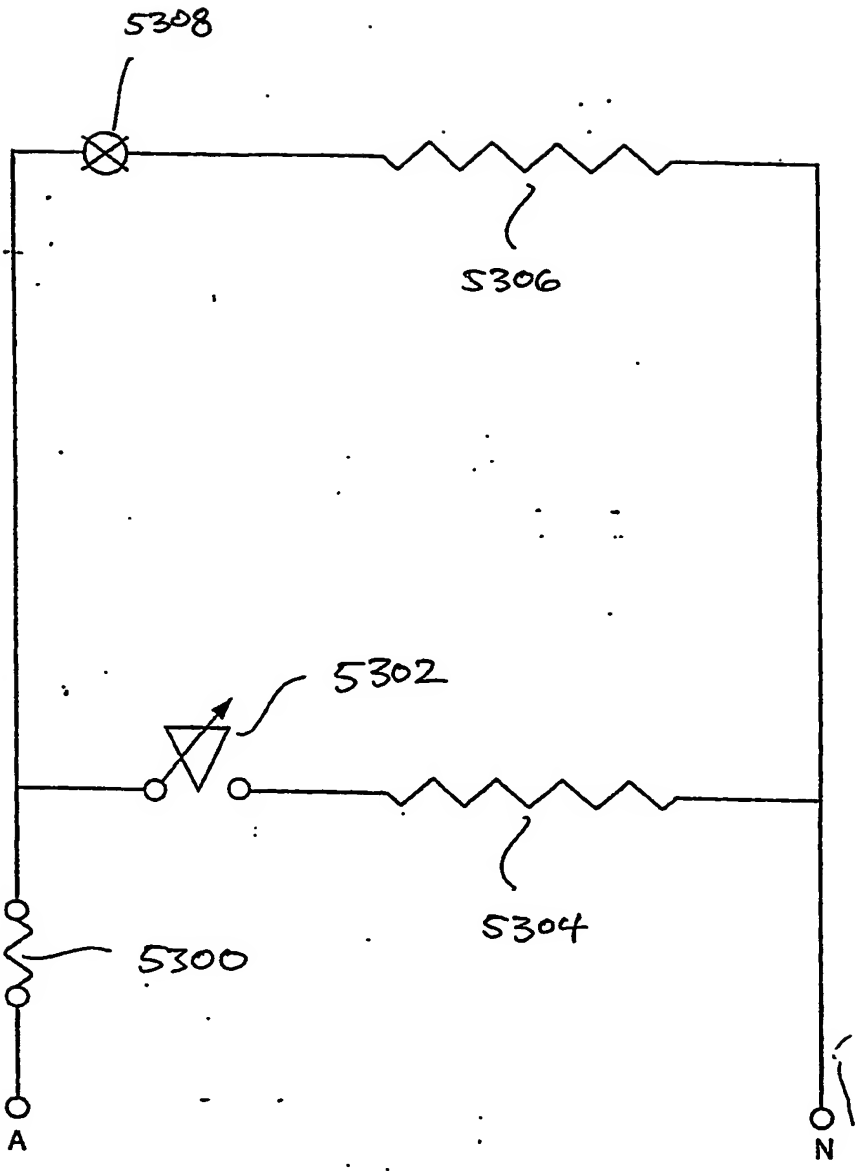

Fig. 53

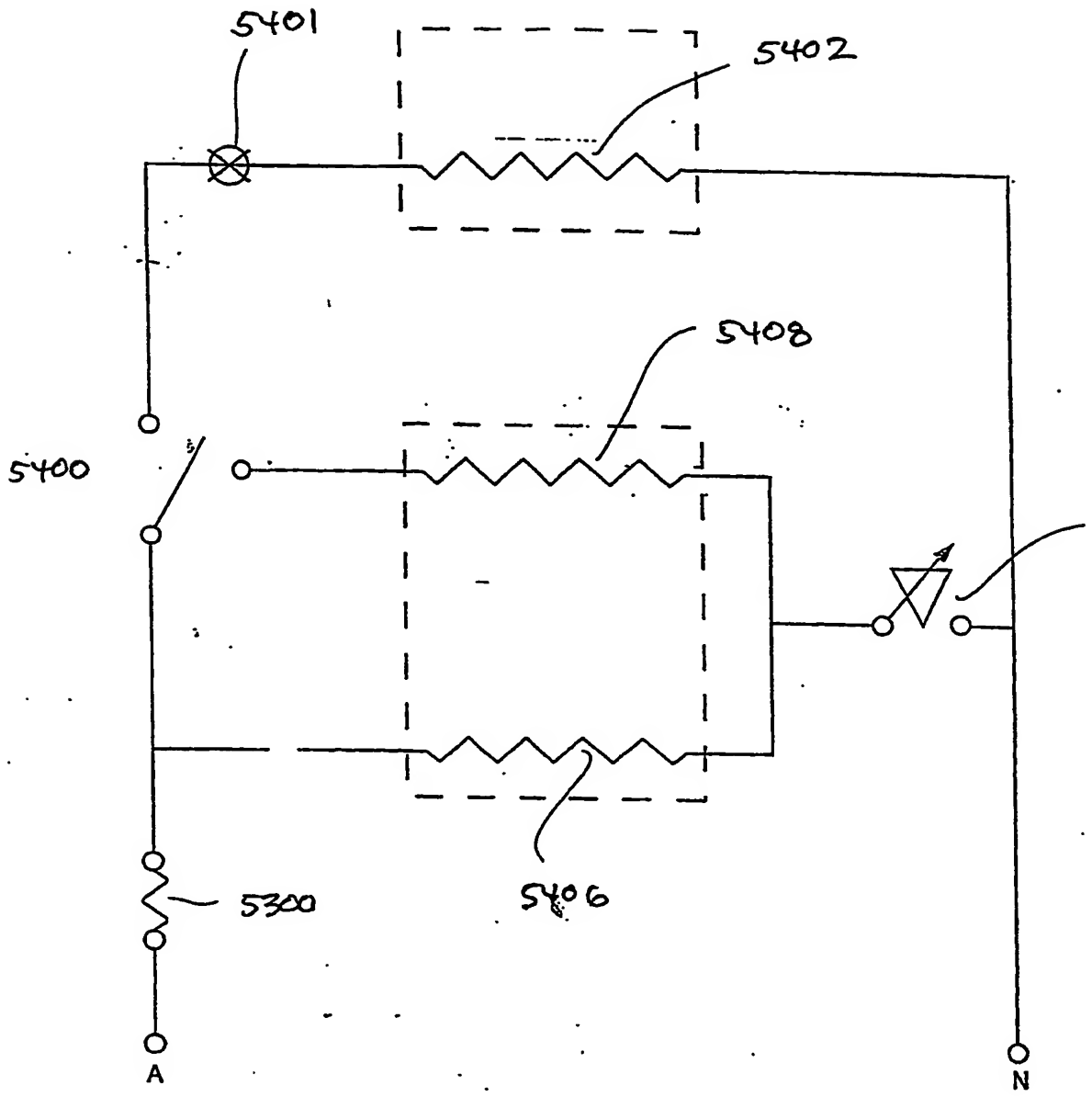

Fig. 54

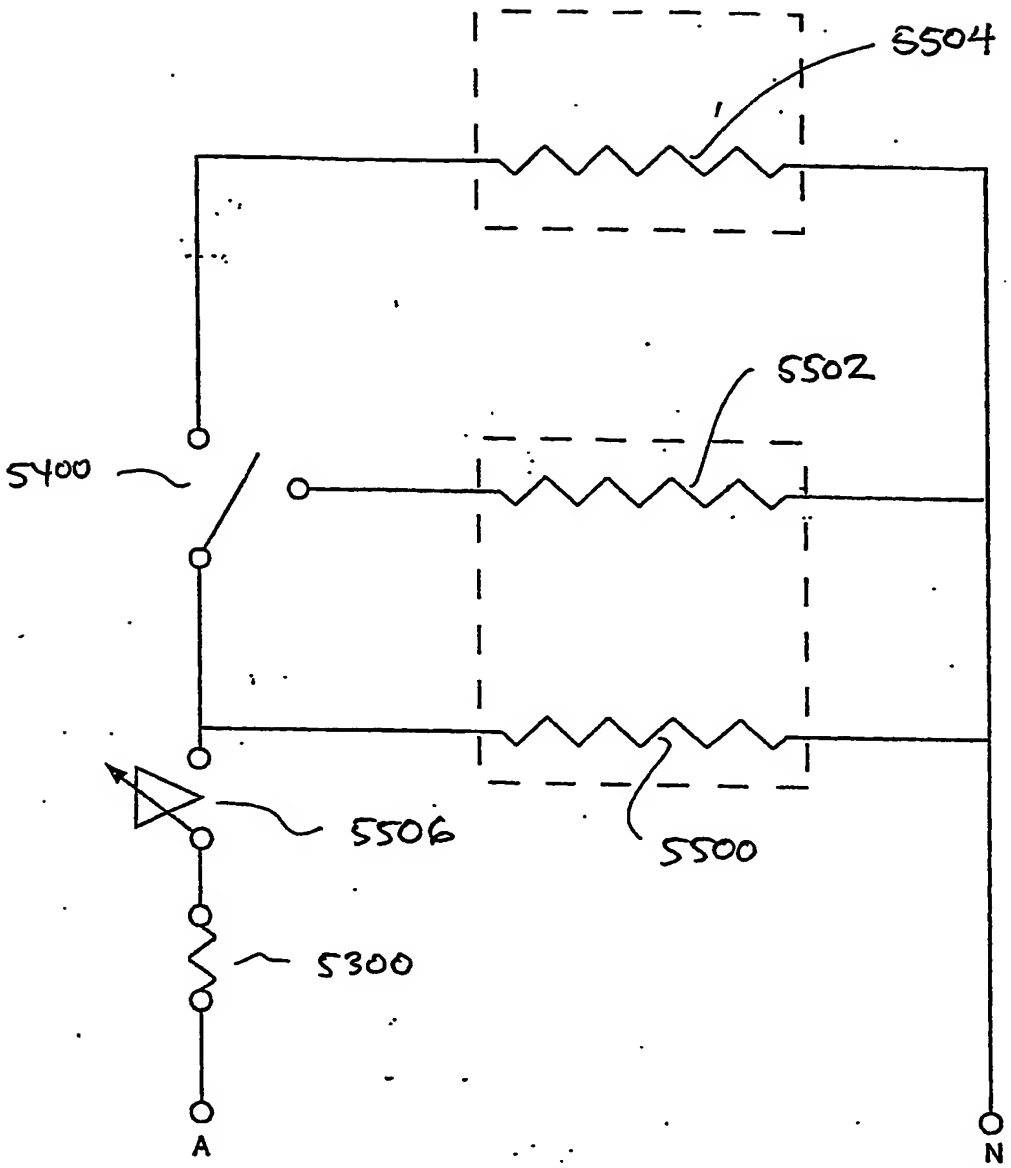

Fig. 55

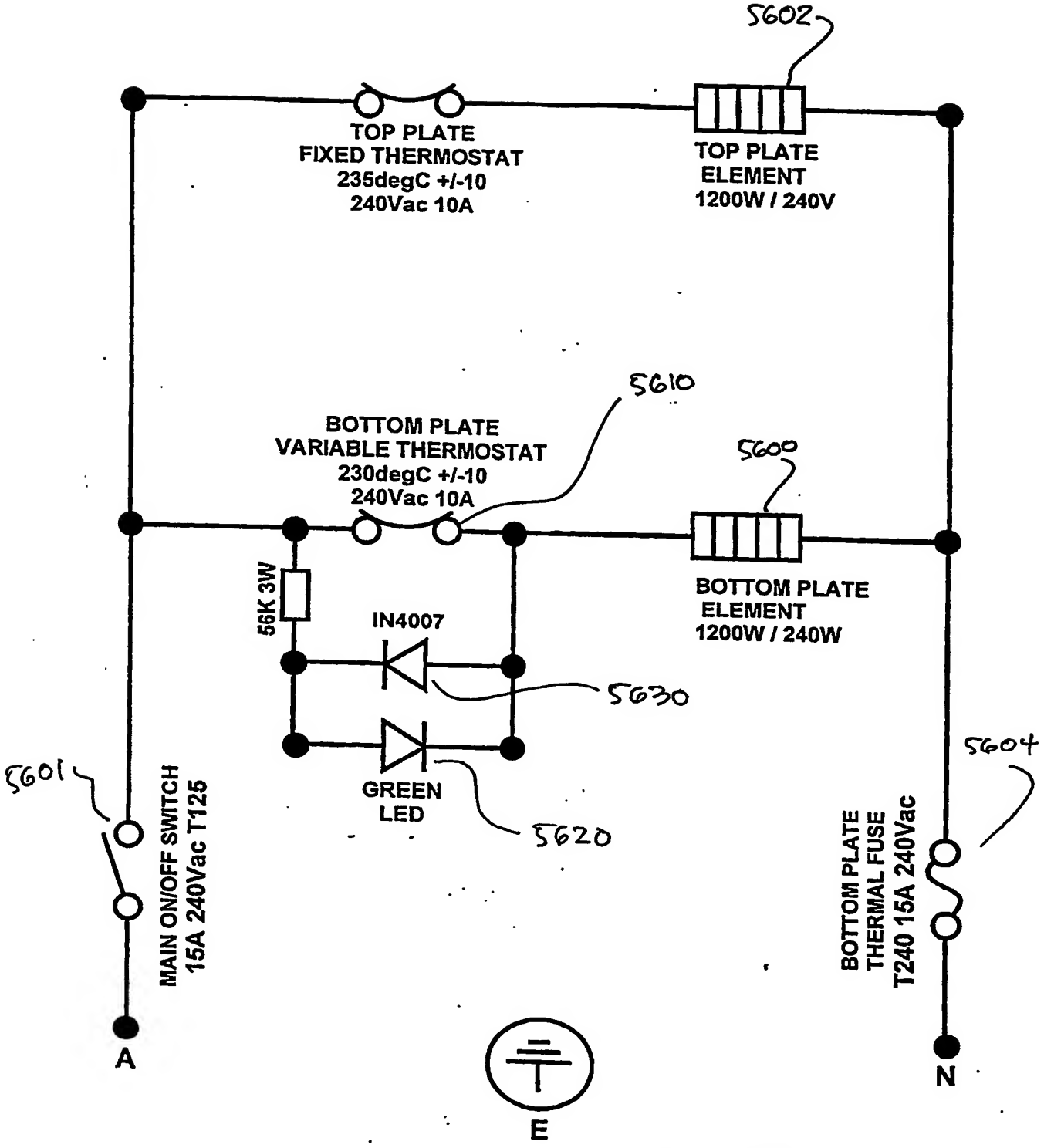
5602
TOP PLATE
FIXED THERMOSTAT
235degC +/-10
240Vac 10A
TOP PLATE
ELEMENT
1200W / 240V
5610
BOTTOM PLATE
VARIABLE THERMOSTAT
230degC +/-10
240Vac 10A
5600
56K 3W
IN4007
BOTTOM PLATE
ELEMENT
1200W / 240W
5630
5601
MAIN ON/OFF SWITCH
15A 240Vac T125
GREEN
LED
5620
5604
BOTTOM PLATE
THERMAL FUSE
T240 15A 240Vac
A
N
E

Fig. 56

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